ENGINEERING NEWS-RECORD

A McGRAW-HILL PUBLICATION

OCTOBER 22, 1953

Charles M. Noble—Heads up fast-rising highway building program (see p. 100)

Six Articles On: HOW TO DO MORE WITH THE CONSTRUCTION DOLLAR

BYERS WROUGHT IRON PIPE

MAKES MAINTENANCE CHARGES "TAKE A DIVE" IN THE NEW SHAMROCK POOL

Built on the same grand scale as Houston's fabulous Shamrock, this new swimming pool is modified fan shape, 165-feet long and tapers from 142-feet to 62-feet wide. It carries 750,000 gallons of water supplied from private wells and purified by sand filters and chlorination. Byers Wrought Iron pipe (which was used in the hotel building for drainage, fire, air and condenser water lines; downspouts; condensate returns; and hot, cold and chilled water lines over 3-inches) was installed to safeguard the swimming pool piping against the various hazards it must combat. Wyatt C. Hedrick, Architect-Engineer on the hotel, designed the pool and Paddock Engineering Company made the installation.

Every experienced designer recognizes that swimming pool piping must be selected with particular care, if excessive maintenance is to be avoided. The corrosive characteristics of the water must be weighed. If the water is recirculated, increased aggressiveness—due to concentration of mineral matter from evaporation and saturation with oxygen—must be anticipated. External corrosion is always a threat, whether the pipe is in the humid atmospheres of a tunnel, or exposed to attack from surrounding soil. Finally, because of filling and excavation, there is generally some settling of the ground, which throws severe strains on inlet and branch lines that only a strong, ductile material can withstand.

Wrought iron has an unusual combination of special service qualities that equip it to meet these conditions. It has been used in dozens of large, modern pools, for supply lines; return or recirculating lines; scum-gutter drains or overflows; vacuum-type cleaning systems; filter-wash lines; underground gas, and electric conduit, lines; plumbing lines in shower and locker rooms; and in plates for metal pools.

In addition to its mechanical strength, wrought iron has a high-purity iron base, through which tiny threads of glass-like silicate slag are distributed. The fibers halt and "detour" corrosive attack, and discourage pitting. They also anchor the initial protective scale, which shields the underlying metal. If you are concerned with pool design, construction or maintenance, we will be glad to show you our Service-Gram on the subject. It contains much helpful information.

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ENGINEERING NEWS-RECORD

VOLUME 143 OCTOBER 27, 1949 NO. 17

WALDO G. BOWMAN
Editor

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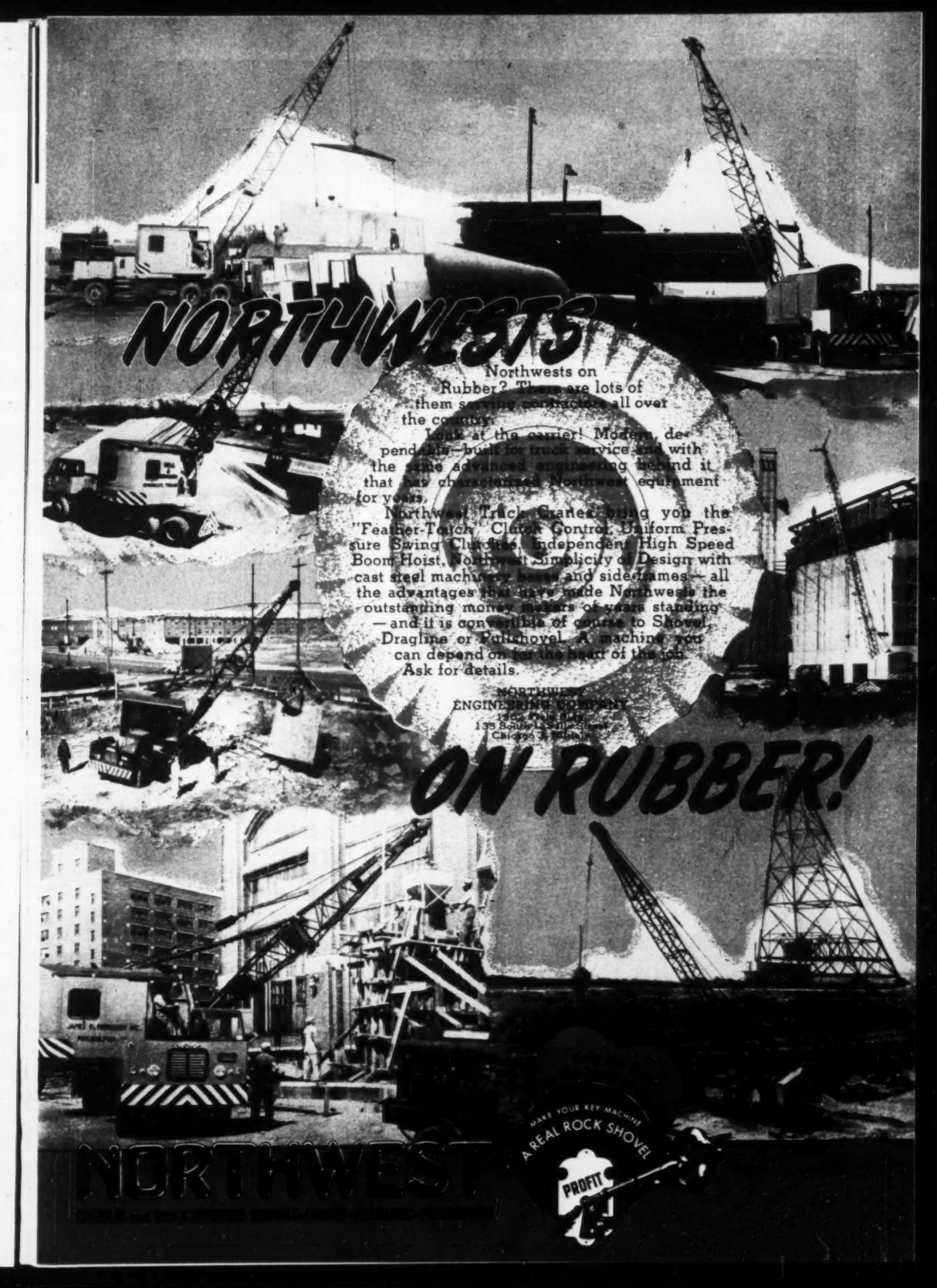
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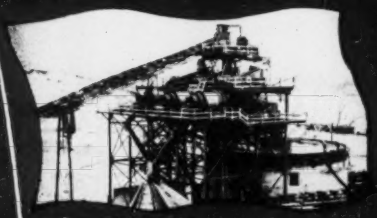
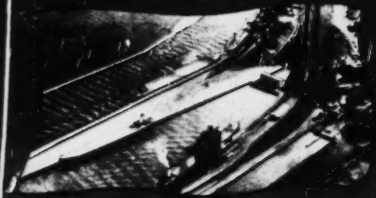
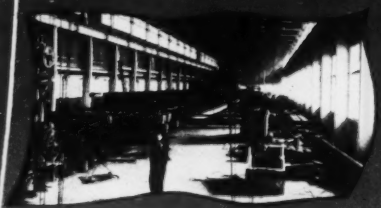


Hydroseparator and rake classifier, part of a complete new sand and gravel plant installed for New York Trap Rock Company.

South elevation of main hospital, built for the Veteran's Administration at Wilkes Barre, Pennsylvania.



Coal transfer docks, each capable of berthing four coal carriers simultaneously built for Baltimore & Ohio Railroad at Lorain, Ohio.



Paper machine installation, part of a complete new pulp and paper mill and bag plant built for the Alabama (St. Regis) Pulp & Paper Company.

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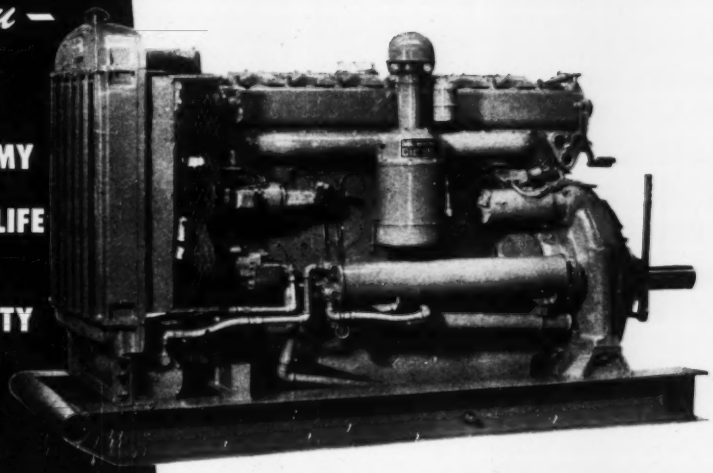

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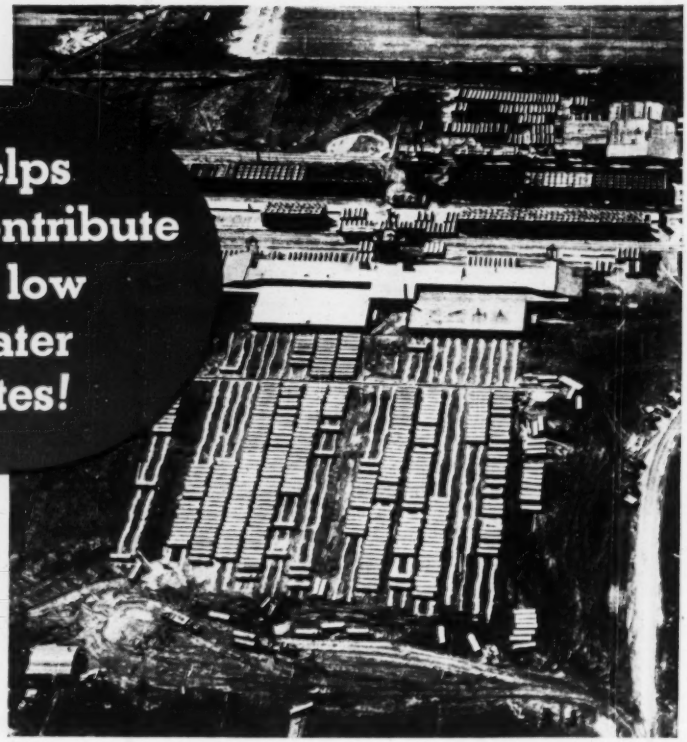

A temporary Lock Joint pipe plant at the site. Use of local labor and materials returns to the community a large part of the pipeline cost.

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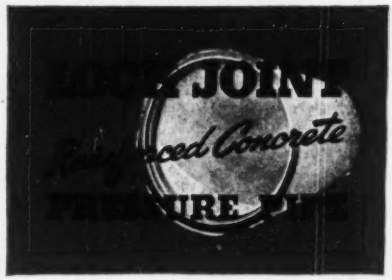

SPRING MOUNTED REAR-DUMP EUCLIDS

This new line of spring mounted Rear-Dump Euclids is designed for greater speed and stability on the haul road and long life in off-the-highway service. Heavy leaf springs are free floating in spring brackets to assure smooth riding and prevent breakage caused by twisting action on rough roads. Axles are positioned to the frame by longitudinal radius rods.

Rear-Dump Euclids with spring mounted drive axles range in capacity from 15 to 34 tons . . . diesel engines to 380 horsepower . . . and have travel speeds up to 32.2 m.p.h. Hydraulic booster steering assures positive control over all road conditions and reduces driver effort on sharp turns and rough hauls.

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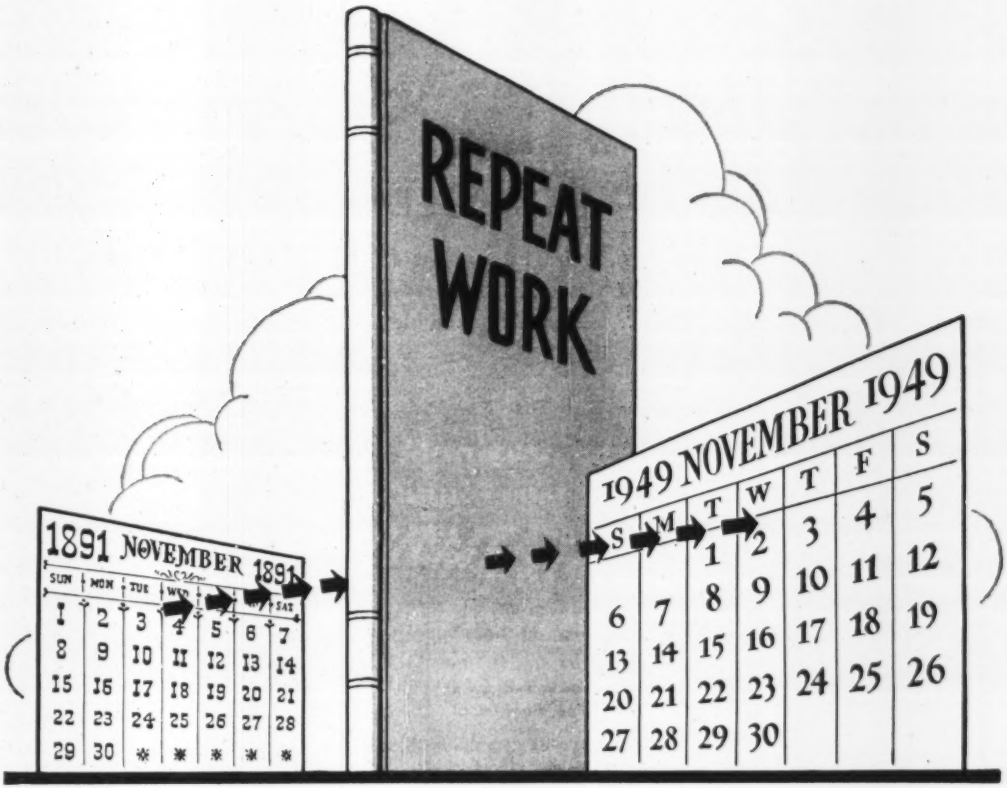

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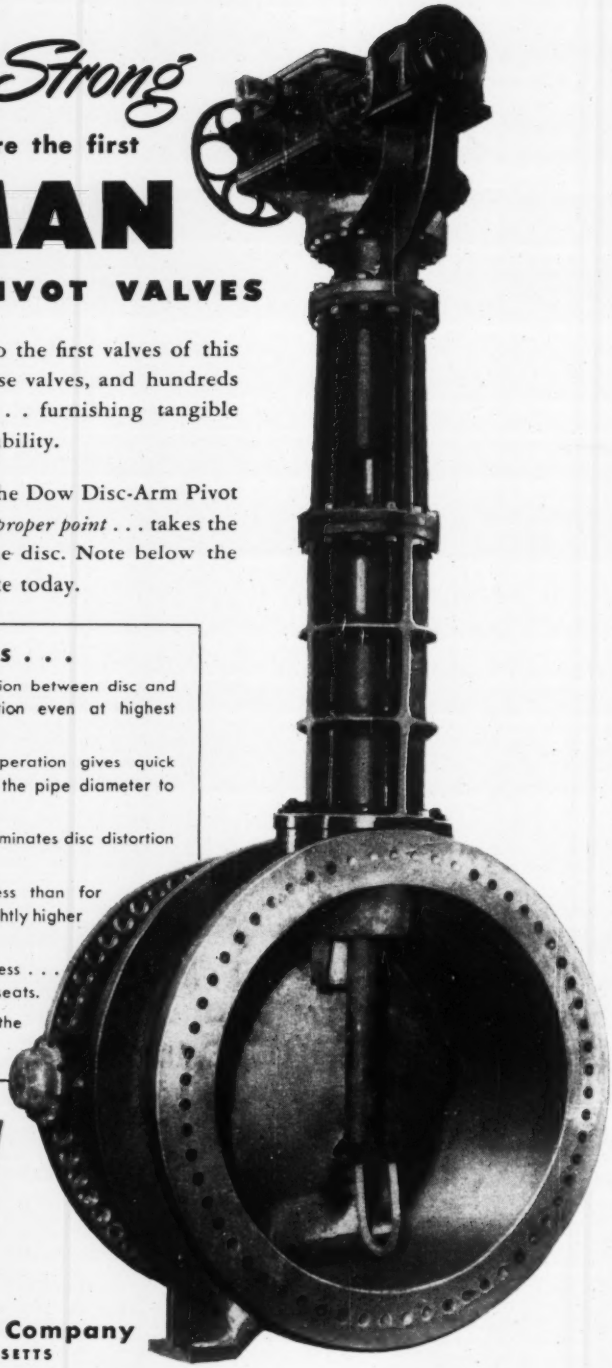

More than a quarter of a century ago the first valves of this design were installed. And today these valves, and hundreds more, are giving excellent service . . . furnishing tangible evidence of unusual strength and reliability.

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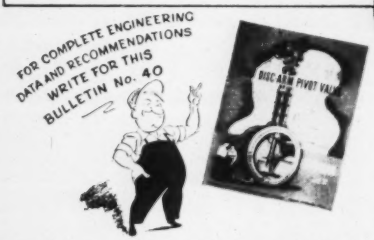
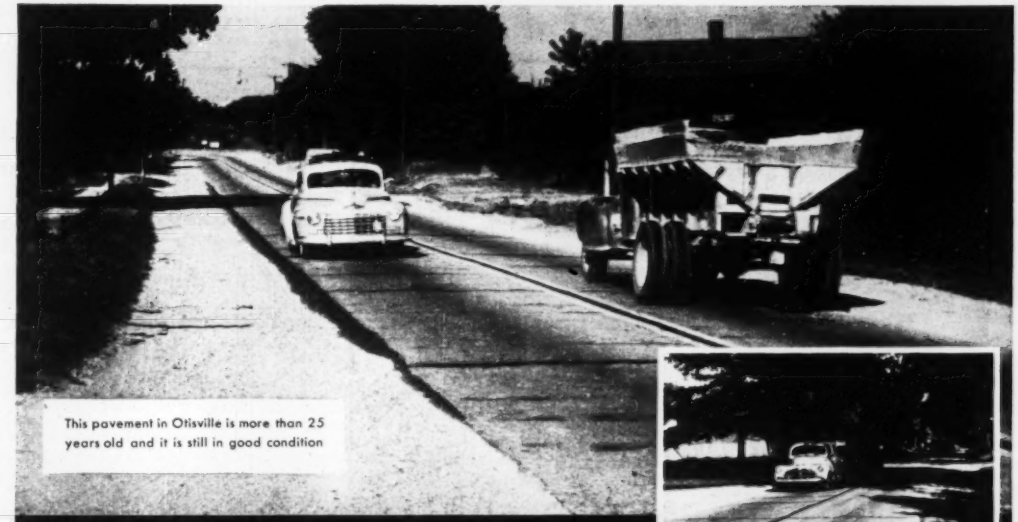
EASY INSPECTION! Disc mechanism is on the downstream side when valve is closed.



The Chapman Valve Mfg. Company
INDIAN ORCHARD, MASSACHUSETTS



This pavement in Otisville is more than 25 years old and it is still in good condition

Genesee County, Michigan, records prove low annual cost of CONCRETE PAVEMENTS

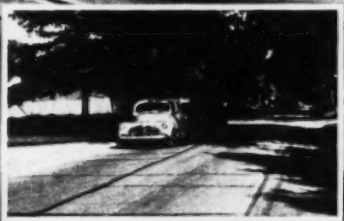
GENESEE COUNTY, Michigan, built 130 miles of concrete roads during the decade 1922-31. All but one mile of this pavement is still in service, is in excellent condition and adequate for many more years of service.

Since 1935 Genesee County has kept detailed maintenance records. These records show that the cost of maintaining the system of concrete roads in the county is an average of only $28.52 per mile per year.

Writes J. T. Sharpensteen, engineer, Genesee County Road Commission, "With such low yearly costs and pavements in good condition, our concrete roads are a most economical type of surface."

The durability and ***low annual cost*** which concrete pavements are demonstrating in Genesee County are typical of its performance in all parts of the country. Concrete usually costs less to build than other pavements of equal load-carrying capacity; it has much longer life; it costs less to maintain. These factors add up to ***low annual cost,*** which pleases highway engineers, taxpayers and motorists.

For more information about durable, ***low-annual-cost*** pavements, write for the free illustrated folder, "*Next Time You Buy a Road.*" Distributed only in the United States and Canada.



Mt. Morris road, built in 1922

Vienna road, west of Clio, 20 years old

Pavement in Linden, built in 1923

Silver Lake road, Fenton, built in 1928

PORTLAND CEMENT ASSOCIATION

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NEWS BRIEFS

Garrison Dam Progress—An 800-ft. section of the rolled earth fill Garrison Dam, N. D., has been raised to its full height of 209 ft. above the bed of the river or 1874 ft. above sea level. This section connects directly onto the western abutment. The embankment now contains 10,000,000 cu.yd. of earth and almost 17,000,000 cu.yd. has been excavated.

Road Building Quota—In connection with North Carolina's $200,000,000 rural roads program, Governor Kerr Scott announced that he is giving highway officials a specific daily goal for the construction of hard-surface and stabilized roads during the next three and a half years. "I am asking the state highway chairman and chief engineer to make this their daily goal: The building of one mile of hard surface road each day in each highway division (The state has 10 highway divisions) for the next three and a half years, plus three additional miles of stabilized roads in each division daily, or a state-wide total daily total of 10 miles of black-top, and 30 miles of stabilized roads," he said.

Reservoir for Willimantic—Army Engineers are in favor of a reserve reservoir for Willimantic, Conn. It would result from construction of the flood control dam in Mansfield Hollow for which bids have been received. Original plans were for a flood control project and the dam would function to hold back flood waters. A conference with Seymour Bigelow, chairman of the lake development committee, at Hartford, disclosed that the engineers will consider a proposal to create three small lakes upstream on the Natchaug River for fishing, swimming and boating.

New Schools for Delaware—Governor E. N. Carvel of Delaware and his School Building Program Board have cleared the way, as far as the state is concerned, for the beginning of a $5,247,412 school building program in the cities of Wilmington, Newark, and Lewes.

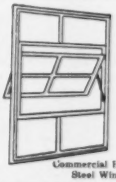
Mobile Infirmary—Plans for a multi million dollar 250-bed infirmary at Mobile, Ala., have been approved by the Alabama Department of Public Health and the U. S. Public Health Service. Bids are to be received by Nov. 29. It will be largely air-con

(*Continued on page 15*)

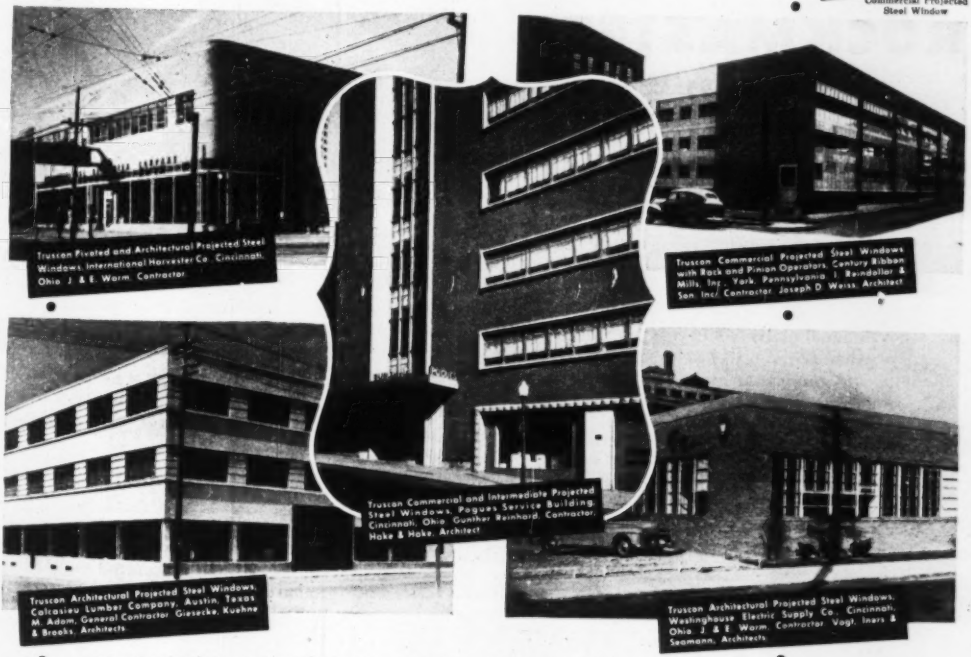
There's a Type of Truscon Projected Window for every building need!..

Office buildings . . . institutions . . . factories . . . industrial buildings . . . and even residential projects, are being made more attractive to look at, to work in, and to live in, with Truscon Projected Window types. In this design the open ventilator does not extend beyond one face of the window plane. All Truscon Projected Window types are available in a great variety of sizes and designs, permitting special or unusual architectural effects.

Architectural Projected Steel Window



Commercial Projected Steel Window



Truscon Pivoted and Architectural Projected Steel Windows, International Harvester Co., Cincinnati, Ohio. J. & E. Worm, Contractor.

Truscon Commercial and Intermediate Projected Steel Windows, Pogues Service Building, Cincinnati, Ohio. Gunther Reinhard, Contractor. Hake & Hake, Architect.

Truscon Commercial Projected Steel Windows with Rack and Pinion Operators, Century Ribbon Mills, Inc., York, Pennsylvania. J. Randall Iker & Son, Inc., Contractor. Joseph D. Weiss, Architect.

Truscon Architectural Projected Steel Windows, Calcasieu Lumber Company, Austin, Texas. M. Adam, General Contractor. Giesecke, Kuehne & Brooks, Architects.

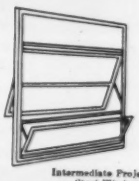
Truscon Architectural Projected Steel Windows, Westinghouse Electric Supply Co., Cincinnati, Ohio. J. & E. Worm, Contractor. Vogt, Imars & Seemann, Architects.

TRUSCON COMMERCIAL PROJECTED STEEL WINDOWS permit the use of large window areas, while assuring distinctive design and unusual economy. This type is also appropriate for use in single openings in smaller industrial buildings or for unimportant window locations in any type of structure.

TRUSCON ARCHITECTURAL PROJECTED STEEL WINDOWS are especially recommended for use in any building where ample ventilation and freedom from drafts are important factors. Rigidity in even the largest ventilators is assured by one-piece casement-type vent frame construction, mortised and tenoned and welded at the corners.

TRUSCON INTERMEDIATE PROJECTED STEEL WINDOWS are of the highest quality available. They are admirably suited for monumental building construction. The design incorporates specially rolled steel casement sections expertly designed and of heavy weight.

FREE LITERATURE. *Write for free 1949 catalog giving complete specifications and installation details of all the units in the comprehensive Truscon Steel Window line.*



Intermediate Projected Steel Window

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Blast for This Road Without Damaging the House?

They Did It!

By Controlling Throw With the

ROCKMASTER "16" Blasting System!

How's this for a tough blasting assignment? The A. B. Long Construction Co., widening a highway through Hunter, Tennessee, was faced with the job of blasting away 14 feet of rock bluff only 47 feet from a home and directly under a main powerline. Rock had to be broken small enough for a ¾-yard shovel. Small blasts would cost too much in time and money. The shooting plan called for firing 174 holes at one time using 525 pounds of Atlas dynamite—depending on the Atlas ROCKMASTER "16" Blasting System to hold vibration and rock-throw to a minimum. Old hands at blasting said that the house was sure to be showered with rock fragments.

They were wrong! Once again, ROCKMASTER "16" did the "impossible"! Not a single rock touched the house or powerline . . . not a single window was even cracked! What is more, shovels moved right in after the blast: the finely broken rock, instead of being scattered all over the place, was in a neat pile almost exactly in its original position.

ROCKMASTER "16" can probably help solve *your* blasting problems—whether you blast rock, coal, or metal . . . on the surface or underground! Read how it's done in the new ROCKMASTER "16" booklet, which tells how this new blasting system, pioneered by Atlas, controls the timing between holes to thousandths of a second. Read how the proper choice of timing, loading, and explosives gives you far better control of breakage . . . saves drilling and dynamite . . . cuts down noise and vibration . . . controls throw as it never could be controlled before.

Write for your copy of the ROCKMASTER "16" booklet today and see for yourself how this latest Atlas development—featuring *sixteen* milli-second delay detonators—can help *you!*

ROCKMASTER "16" TIMINGS

Rockmaster No.	Avg. Time of Each Delay from Zero (milli-seconds)
0 (zero)	0 (inst.)
1	8
2	25
3	50
4	75
5	100
6	125
7	150
8	175
9	200
10	250
11	300
12	350
13	400
14	450
15	500
16	550

ROCKMASTER: Reg. U. S. Pat. Off.

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ditioned. About $2,000,000 has been pledged locally to obtain the amount of federal aid needed for the structure.

Soil Testing Lab.—A laboratory for testing soil, concrete, concrete aggregate, rock specimens and other construction materials will be established by the U. S. Army Corps of Engineers at Troutdale, Ore., to serve the North Pacific Division, composed of the Portland, Seattle and Walla Walla engineering districts. Included in the plant will be a concrete laboratory for testing specimens of concrete used in dam construction (including a new freeze-thaw testing unit), a chemical laboratory for the petrography branch for testing rock specimens, and a laboratory for testing soils used in earth-fill dams.

Ground Water Survey—A 2-year survey will begin shortly to determine additional ground water supplies in 40 communities surrounding Detroit, Mich. Inadequate water supplies have, for some time, hindered industrial development there. The cost of the survey will be split by the communities and the United States Geological Survey.

A $10,600,000 School Plan—A $10,000,000 school plan has been drawn for St. Paul, Minn., by the Bureau of Field Studies of the University of Minnesota, M. G. Neale, director. The program calls for six new elementary buildings to replace eight existing buildings with a redistricting to cost $2,760,000. Additions to existing buildings to include class rooms and auditoriums, $4,425,000; rehabilitating existing buildings, $1,610,000; and $609,500 for sites, surveys, etc. Recommended for high school renewals is $1,303,000.

State Aid for Local Roads—A special commission has begun a series of inspection trips through North Carolina to study the problem of sharing state highway funds with municipalities. The group is discussing street construction with municipal officials to acquaint itself with the physical and financial problems involved together with present and future needs of urban traffic. The commission will make recommendations to the 1951 state legislature about allocating a larger portion of highway funds to municipalities, which now are receiving $2,500,000 a year from the highway funds.

Ontario Schools—By 1951 about $75,000,000 will have been spent in Ontario on new schools and additions over a 5-year period.

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ROLLING DOORS
Open upward smoothly, easily
Save floor and wall space
Coil completely out of way
Rugged all-metal construction
Extra all-around protection
Motor or manual control
You get better door service at lower cost in Kinnear's combination of efficient coiling upward action and protective, all-metal, interlocking-slat construction. Kinnear Rolling Doors give you maximum use of space around doorways. They open and close with smooth, time-saving ease, year after year. They defy wind, weather, or intrusion. Electric push-button operation available, with remote controls if desired. Kinnear Rolling Doors are built in any size, for new or old construction. Write for complete details today.
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On Time-Everytime

Within its digging range of a full 5-foot depth and widths from 10" to 20", the CLEVELAND "92" gives you a machine of unsurpassed versatility that you will use and appreciate to the maximum.

The "92" cuts not only the foundations for buildings but the services as well. It cuts for signal and lighting trench and tiling on airport work. Digs for telephone and power cables and conduit. Fits exactly into drain tile and irrigation work. In fact it's the workingest trencher you ever saw or used.

Be sure to get the details and specifications from your nearest CLEVELAND distributor.

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THE CLEVELAND TRENCHER CO.

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Low Cost Roads—Georgia is soon to embark on a program of a new type all-weather rural roads at about half the present cost of $16,000 a mile. Governor Herman E. Talmadge has received federal approval on the type of roads to be constructed with funds now available.

Hanford Works—Cost estimates on the $230,000,000 first phase of the Hanford, Wash., Works construction program will be exceeded by only six-tenths of one per cent, predicts F. K. McCune, assistant general manager of the General Electric Co.'s nucleonics department at Richland, Wash. The first phase, involving 65 projects, is now nearing completion, although an additional $450,000,000 is scheduled to be spent on construction during the next 10 years. It began in 1947.

New Schools Needed—Movement of settlers onto newly-irrigated lands of the Columbia Basin in Eastern Washington, beginning in 1952, will then create a need for new schools costing an estimated $40,000,000, the Washington State Columbia Basin Commission was told at a recent meeting. In the town of Quincy, the school now has only 200 pupils but, when 25,000 acres is opened to farming near Quincy in 1952, the enrollment is expected to grow to 650. Enlarging the school would cost an estimated $360,000.

THE COVER

Studious-looking, hard-driving Charles M. Noble stepped out of a long career as a highway engineer and specialist on parkways and freeways to join the Navy's Civil Engineer Corps during World War II, then stepped back into his chosen field in 1946 as New Jersey Highway Engineer.

Now Noble is heading the state's biggest attempt at modernization of its highway system—a 118-mile toll turnpike that will bisect New Jersey to provide a free-flowing connection between major metropolitan areas (see p. 36).

Now 53, Noble served briefly in the first World War, then entered a long period of engineering work, which included highway and parkway design in the South, 13 years with the Port of New York Authority, and other jobs. He re-joined the Navy early in the late war, and as a CEC officer, commanded a naval construction regiment, did engineering reconnaissance behind Japanese lines in preparation for landings on the China coast, and was a member of the staff of Admiral Chester Nimitz, at Pearl Harbor.

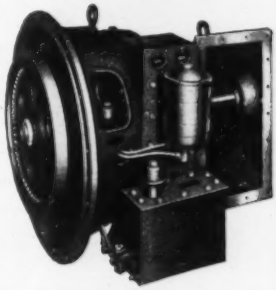
Most Popular Item...

IN THE STEEL ERECTION · BUSINESS

● Because Twin Disc Hydraulic Torque Converters permit exact "spotting" of heavy steel beams without jerkiness, contractors engaged in steel erection specify them as a "must" on their lift cranes.

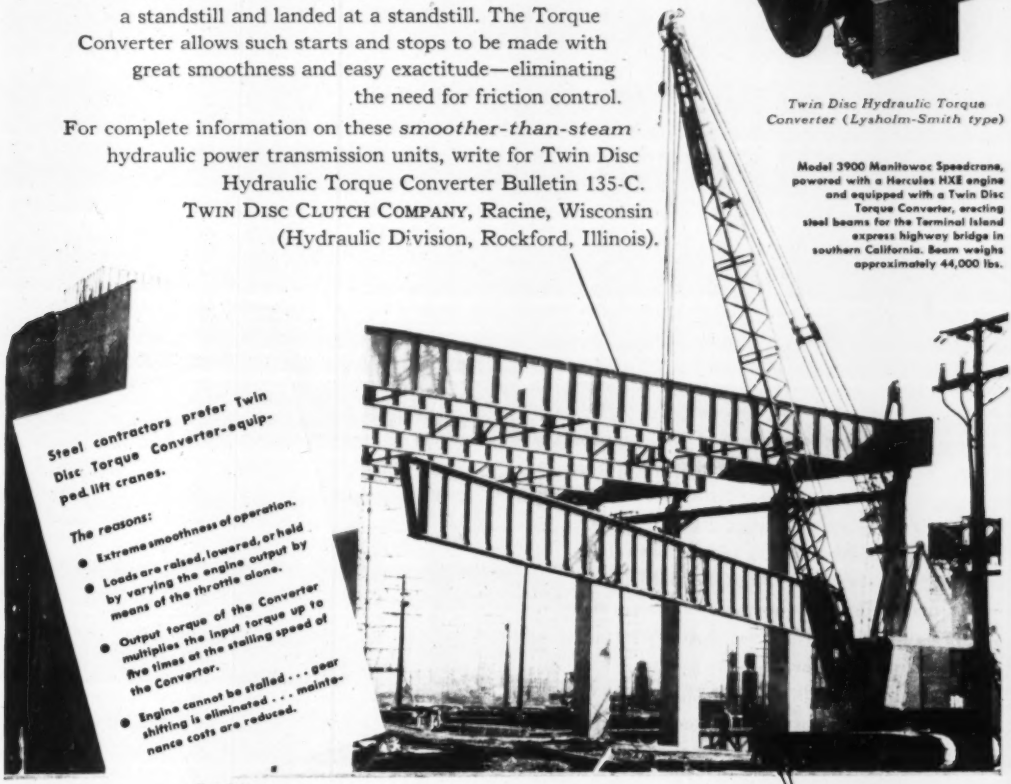
In this type of work, where both the travel and hoisting mechanisms are used more frequently than in other types of construction work, every load has to be started from a standstill and landed at a standstill. The Torque Converter allows such starts and stops to be made with great smoothness and easy exactitude—eliminating the need for friction control.

For complete information on these *smoother-than-steam* hydraulic power transmission units, write for Twin Disc Hydraulic Torque Converter Bulletin 135-C.
TWIN DISC CLUTCH COMPANY, Racine, Wisconsin
(Hydraulic Division, Rockford, Illinois).



Twin Disc Hydraulic Torque Converter (Lysholm-Smith type)

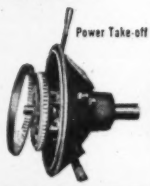
Model 3900 Manitowoc Speedcrane, powered with a Hercules HXE engine and equipped with a Twin Disc Torque Converter, erecting steel beams for the Terminal Island express highway bridge in southern California. Beam weighs approximately 44,000 lbs.



Steel contractors prefer Twin Disc Torque Converter-equipped lift cranes.

The reasons:

- **Extreme smoothness of operation.**
- **Loads are raised, lowered, or held by varying the engine output by means of the throttle alone.**
- **Output torque of the Converter multiplies the input torque up to five times at the stalling speed of the Converter.**
- **Engine cannot be stalled . . . gear shifting is eliminated . . . maintenance costs are reduced.**



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new!

a 55-lb. class sinker with a 4-in-1 backhead

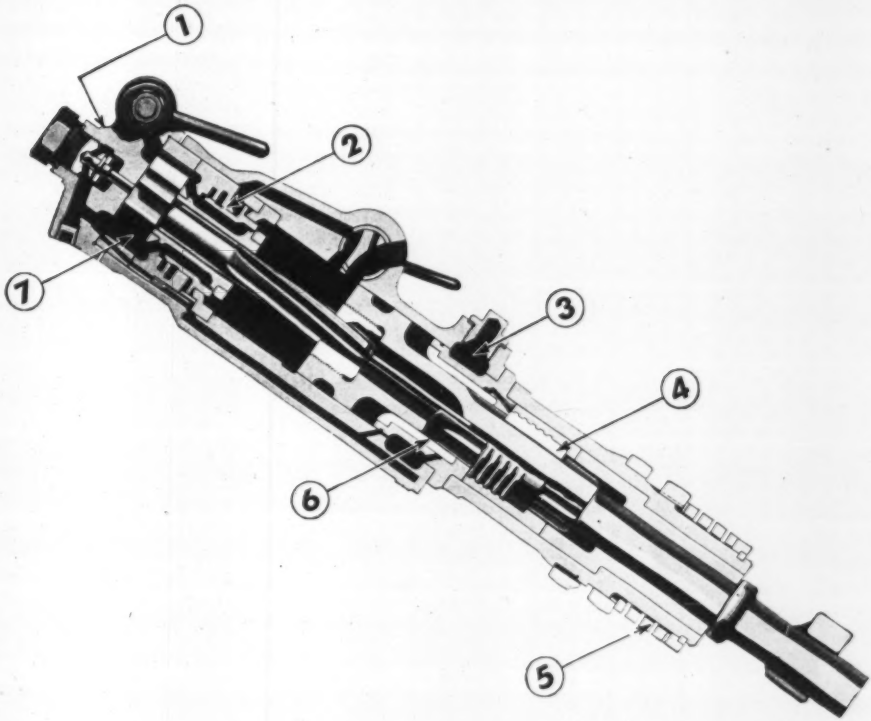
New in design . . . easy to hold . . . tops in drilling speed, rotation, hole cleaning and all-around performance . . . is the new CP-59 Sinker Drill.

Now, for the first time, you can get a sinker with a 4-in-1 backhead that meets *all* operating conditions: **plain dry . . . blower dry . . . plain wet . . . air-water** operation. One backhead meets all four requirements; change-overs from one type to another are quick and inexpensive.

Entirely new valve design gives maximum drilling speed and rotation power, with minimum air consumption. Large, flexible retainer spring makes for easy operation. A new type of lubricating system assures positive lubrication of all working parts.

Rotation nut and cylinder bushing liner are bronze, to eliminate scoring and reduce maintenance.

For complete information, ask for SP-3009.



Top performance, minimum upkeep are assured by these features of new CP-59 Sinker:

1 Four-in-one backhead; plain dry, blower dry, plain wet, air-water operation.

2 New type valve gives exceptional drilling speed with powerful rotation.

3 One oil chamber efficiently lubricates entire drill;

4 Replaceable bronze chuck rotation nut protects piston splines from scoring.

5 Large, flexible retainer spring assures easy operation;

6 Replaceable bronze cylinder bushing liner makes it easy to maintain full cushion and piston alignment.

7 Four reversible pawls double service life.

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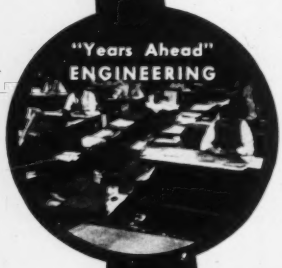

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There's the "years ahead" design from bow to stern. Our engineering staff thoroughly studies your requirements — water conditions, type of material to be handled, available power, distance to spoil area, etc. Specifications are then drawn for peak dredge performance under these conditions.

In transforming these specifications to efficient machinery, Bucyrus-Erie foundries, shops and laboratories are vital factors. Here, castings and forgings are produced under painstaking control and test. Flame-hardened, heat-treated, alloy steel parts are supplied wherever needed. They are precisely machined and assembled in completely equipped shops.

One company responsibility—from drawing board to delivery and beyond. It's your best guarantee of a truly efficient dredge; one that delivers the maximum output at minimum cost under your operating conditions.

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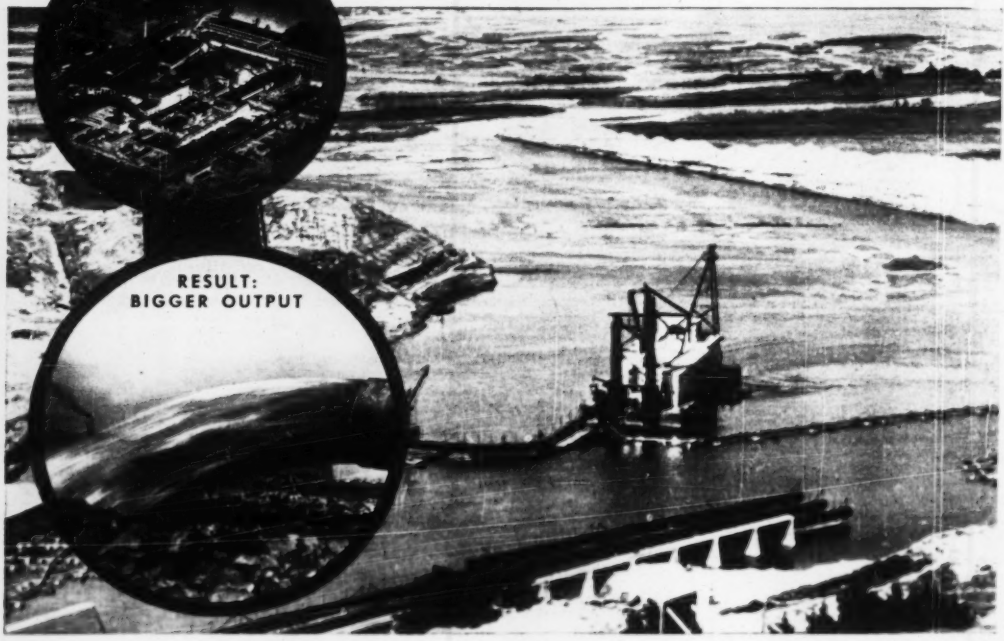


THE CONSTRUCTION WEEK

WHERE DO TAXES GO?—In the years 1940-1948, highway users paid $3 billion more in federal, state and local taxes than was spent on the roads, members of the Senate's Interstate Commerce Committee have discovered. They haven't answered the question of whether this tax load is spread equably between truck and auto, or what happens to the difference between what goes in and what comes out. But the Senators have figured out that the motor vehicle taxes paid in the nine-year period exceeded federal-aid grants by at least $1 billion. This should be an answer to claims that highway users as a group are being subsidized.

HOUSING PUT OVER—Housing legislation that would include direct government loans to cooperative projects and to veterans has been held over by the Senate, probably for a vote at the next session. As a stopgap, Congress instead extended present mortgage insurance and other existing financing aids for private housing.

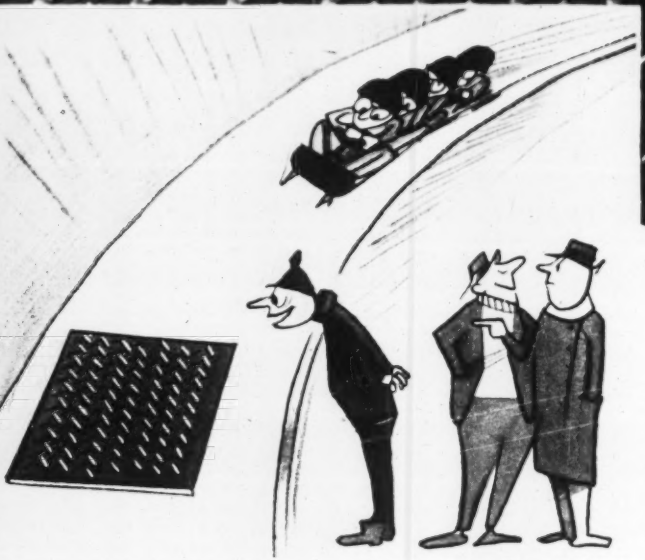
APPOINTMENT POLITICS—When a Senate committee tabled ex-Senator Mon Wallgren's nomination as chairman of the National Security Resources Board earlier this year, it used an unusual parliamentary device to inflict the third political defeat of a few days on President Truman. Involved also were: The assertion that Wallgren hadn't the qualifications to man the involved NSRB job, a filibuster by Washington's Senator Harry Cain, and a violation of the old rule of Senatorial courtesy, which ordinarily demands that the Senate accept promptly the nomination of a former member of the Senate. By naming Wallgren to the Federal Power Commission, vice Leland Olds, Mr. Truman got double revenge. First, he settled the Wallgren score, since either the Senate must observe its Senatorial courtesy tradition or concede that its NSRB argument of last spring was a phoney. Then too, by appointing public-power-minded Wallgren to replace public-power-minded Olds, Mr. Truman checkmated the power and oil and gas industries, which worked hard to beat Olds' nomination, even though the President had specifically made Olds vote a party loyalty issue.

STEEL FOR NEW ENGLAND—Eyeing the vast iron-ore deposits now under exploration in Labrador, New England communities are beginning to plan to attract steel mills to that area. Latest move is by Gov. Chester Bowles of Connecticut who has appointed a six-man advisory committee to investigate possible steel-mill sites. New Englanders, with good seaports and good rail connections with the rest of the steel-consuming U. S., see themselves in an advantageous spot to beat out Great Lakes transport of Labrador ore to existing steel mills. Pittsburgh and the other steel centers do not appear to be worried. Seeing empty coal cars that now move inland from big coast cities, they appear to conclude that it would be cheaper to build docks for trans-shipment of ore to these cars than to build steel mills at North Atlantic coast harbors.

PLANT, EQUIPMENT SPENDING SLIDES—Although industrial spending for plant and equipment during the last half of this year is expected to hit a $17.9 billion total for 1949, the trend is downward. Security and Exchange Commission experts say it now looks certain that the 1949 figure will be about 7 percent below 1948's record $19.8 billion—in spite of the fact that earlier surveys didn't indicate a drop of quite as much as that.

WAGE PACE SLOWS—Building trades union wage scales rose only half as fast in the third quarter of this year as they did in the same period in 1948. BLS reports the rise from July 1 to Oct. 1, 1949, was 1 percent—compared to 2 percent in 1948. BLS statisticians ventured a cautious opinion that wage rates may be reaching a plateau—citing the fact that wages have risen only 3 percent thus far this year, as compared to 8 percent in 1948. Incidentally, average wage for all union workers in construction was found to be $2.20 per hour on Oct. 1.

DELIVERED PRICING HOLDUP—Businessmen who have been waiting long for a law legalizing delivered pricing will have to wait a while longer. Congress has decided to hold up action on any such law until along toward the end of January. The delay was caused by a pint-sized filibuster on another matter, which succeeded in making a gallons-sized jam as the Congress rushed madly toward adjournment. When the present bill is finally brought up, however, you can look for an all-out fight turning on the classic issue of hard vs. soft competition—should the seller be allowed to go free of charges of price discrimination, if he can show that his lower price was made to meet the price of a competitor. The senators will still be arguing about legalizing basing points—but observers feel the real fight is centered on the competition angle.



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Feet and wheels, too, find positive traction on Inland 4-WAY Safety Plate. That's why 4-WAY cuts down plant accidents. Its raised lug pattern provides positive traction—on steps, floors, ramps, walkways, platforms—grips firmly in all directions. If slipping accidents are causing lost man hours in your plant (or if slip-resistance will improve your product), find out more about 4-WAY Safety Plate.

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CONSTRUCTION TRENDS

Which Way Pensions?

With basic industries agreeing to pension plans this fall, next year will see the pension issue crop up in collective bargaining in industry all across the country.

Many of this year's agreements follow the Ford pattern: Pensions are a $100 a month, beginning at the age of 65, with companies paying the difference between Social Security and the $100. Social Security payments for workers being retired now probably average under $35.

Big issue in the steel strike was whether or not workers should contribute to schemes for pensions and social insurance programs.

That, however, is not likely to be a major stumbling block in most company-union negotiations. Workers now contribute in probably one-half or more of the pension plans in effect. They probably contribute to an even bigger proportion of the health and medical insurance plans underway. And, of course, everyone who is covered contributes to Social Security.

The coal and steel strikes leave no doubt as to the importance workers place on pensions. In addition, a survey by FACTORY, another McGraw-Hill magazine, found that workers put pensions first among the things they want from their employers—74 percent of those polled thought pensions a first requirement.

There are good economic reasons behind the drive for pensions. Today, the country has some 10 million people more than 65 years old. Many of them are working—because the average pay check is far larger than Social Security. Nevertheless, some 1.4 million people are receiving federal old age insurance payments and another 2.7 million receive payments under other federal programs to assist older people.

The average worker reaching 65 can expect to live another 12 years. His wife may expect to live on the average another 14 years after she reaches 65. The great depression and the inflation that came with World War II have made it impossible for most families to save enough to support themselves through the years of retirement. About 80% of all families, by surveys of the Federal Reserve Board, have less than $2,000 in government bonds, bank accounts and other liquid assets.

Obviously, the country has a major problem in seeing that these people have an income during their years of retirement.

Are private pension plans—set up by industry and unions—the answer?

From the national viewpoint, private plans are not the final answer. And the construction industry is a prime example of the difficulties inherent in such plans. There are a few large firms—in all industry and in construction—that can afford to set up adequate pension plans. But most companies would have great difficulty in doing it. One reason is that every sizeable company has a large group of workers who can expect to retire in the next few years, but who will have contributed little or nothing to their pension plan. To take care of these people on a $100 a month scale, the company either has to set up a big cash reserve for the fund or it has to meet the heavy costs of pensions for these people from current earnings. The great majority of all businesses probably could not meet those requirements.

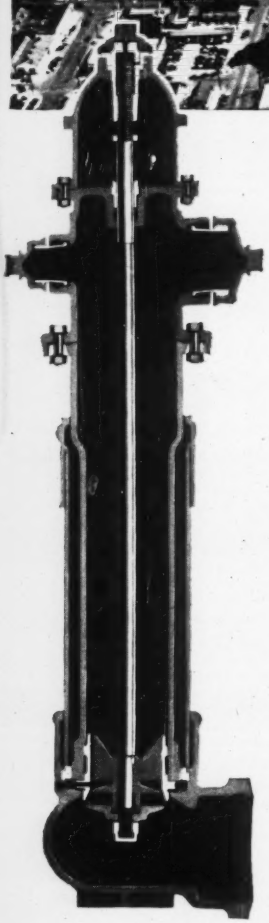
There are other reasons why private plans cannot do the whole job. In industries like construction, where much of the work is seasonal and where workers shift from job to job frequently, many workers simply would not be eligible or might lose their pension rights by shifting from one job to another. But the big reason why private pension plans cannot meet the whole problem is that they will not cover all workers. Outside of the large and prosperous companies in stable industries, most workers are likely to find private pension plans are sketchy or missing altogether. Even in 1945, generally a prosperous year, about one corporation out of four went into the red. Obviously these companies could not afford pensions.

On the economics of the pension problem alone, a national plan seems the best solution.

Social Security has basic advantages: Everyone contributes, everyone has the same rights in the plan. Under it, workers may move from company to company, taking their pension rights with them. It can be built up to give everyone minimum security—but still leaving room for private plans that would give workers the incentive of higher retirement pay.

As yet, however, the federal plan is far from ideal. And it will not be under the new bill approved by the House, but not yet passed by the Senate. The bill would extend coverage of the plan, to bring some 46 million workers in all under it, but it would still leave important groups outside. It would increase benefits by about 70%—but still leave the average benefit only about $44 a month.

Big and complicated as the pension question is, there can be no easy solution to it. The country will hear a lot more about pensions in the next few years—both in and out of politics.



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They back up their statement by pointing to the Mathews Modernized Hydrants used by this great seaport. Wherever you see Mathews, you know there is safety *plus*.

Mathews Modernized Hydrants are the last word in simplicity of design. All working parts are contained in a removable barrel. The bronze revolving nut is capped by an iron shield operating nut which is resistant to wrench wear. The operating thread is not exposed to water—is protected from sand and grit. The stuffing box plate, cast integral with the nozzle section, is strong, safe and leakproof. The simple, rugged construction of the Mathews offers the utmost dependability and the least in maintenance requirements.

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Higher Productivity—Lower Costs

COST-CUTTING TECHNIQUES, such as those detailed by six "Higher Productivity-Lower Costs" articles in this issue, always are welcome. They are especially welcome now, when it appears that costs are rising again.

Through good times and bad the engineer tries to reduce costs by the one means within his control—the exercise of his own ingenuity. He tries a little harder, though, when cost factors beyond his control fail to net a reduction. Some of those other factors are labor productivity, ease of material supply and tight bidding. Right now those factors, which have been important cost-reducers in recent months, are losing force as labor costs continue to rise.

So this is the time when the engineer will need to exercise still greater ingenuity. To that end, ENGINEERING NEWS-RECORD begins in this issue the publication of articles centered on means for cutting the costs that come within the control of civil engineers and construction men.

New Jersey's Toll Turnpike

NEW JERSEY, hard pressed for money to build badly needed highways, has turned to private financing for a 118-mile toll turnpike running almost the entire length of the state (see p. 36). Having observed the financial success of the Pennsylvania Turnpike, the New Jersey legislature took this step in preference to a state bond issue or an increase in the gas tax, both of which were widely opposed.

Discussion of the soundness of that decision at this time would be academic because it is an accomplished fact. Of more than academic interest, however, are other aspects of the projected turnpike. In the first place, part of it lies roughly along one of the routes where the 1939 report "Toll Roads and Free Roads" estimated that a toll highway would pay. Then, however, the maximum per-mile cost was set at $1,158,000. Today, the average for the New Jersey road is $1,500,000. Maximum costs will run to several times that amount.

These high costs, obviously, will affect the tolls. What the tolls are to be will not be announced until actual costs for each main section are known. The turnpike authority, quite properly, plans to charge tolls for each section that should produce a return sufficient to pay the cost of that particular section. In other words, part of the cost of getting through the built-up industrial area of northern New Jersey is not to be saddled on users of the highway in south Jersey.

This plan means, however, that on the costly 30-mile section through northern New Jersey, interest and amortization charges will be high. Also, as it is proposed to have eight points of entrance and exit along this section to give the highway the greatest usefulness, toll-collection costs will be high. These high costs will be offset in part by the fact that the greatest traffic volume is anticipated here, yet it appears probable that toll charges must be fairly high.

At first glance, the need for such a high toll would appear to foredoom the project to failure in view of the fact that there are parallel free roads. But similar predictions were made about most of the toll bridges and tunnels that have been built, only to be in error in most instances.

Not all of the traffic that is anticipated for the northern end of the projected turnpike is expected to move over the entire 30 miles between New Brunswick and the connection to the George Washington Bridge. For example, seashore traffic to and from New York points would use the turnpike for 22 miles or less. Consequently, this New Jersey Turnpike will demonstrate better than any previous toll highway what the general public is willing to pay to avoid traffic congestion even for short distances. Such information should be of value to those considering toll facilities in other parts of the country.

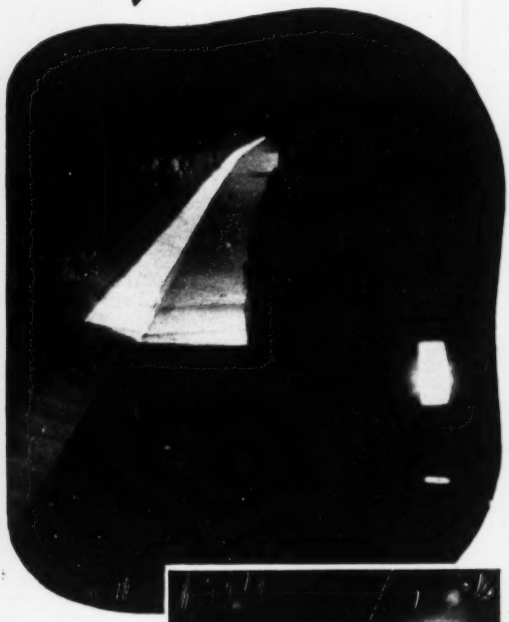
Teaching the Professional Concept

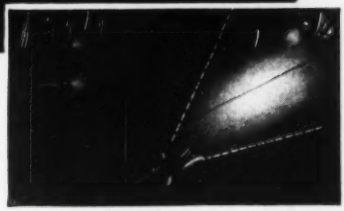
RENSSELAER POLYTECHNIC INSTITUTE celebrated its 125th anniversary last week. That event serves to recall that engineering education was launched in the United States on a truly American concept. Stephen Van Rensselaer, founder, in stating that he was establishing a school for teaching the "application of science to the common purposes of life" set a pattern that was closely followed and amplified in the ensuing years by the directors and teachers in the school. Incidentally, in stating his objective, Van Rensselaer wrote a definition of engineering that antedated Tredgold's famous definition: "The art of directing the great sources of power in nature for the use and convenience of man."

It was Amos Eaton, the first head of the institute, who got Van Rensselaer to back his pioneering venture of "teaching by doing," which was then a new educational idea. But from the record it would appear that it was Benjamin Franklin Green, who succeeded Eaton in 1842, who inaugurated the teaching of engineering as a professional calling rather than a skilled trade.

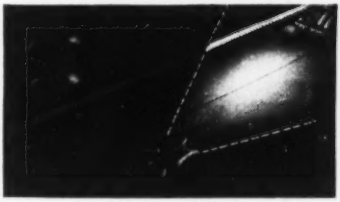
The complex industrial life of today incubates many tendencies toward destruction of this professional concept of engineering. It is fortunate, therefore, that Rensselaer marked this anniversary by calling on industrial leaders to help its students and faculty look ahead toward equitable solutions of new problems rather than back at past accomplishments.

A Ribbon of white... Day and Night





A smooth curb wastes the car's headlights. It deflects light away from the driver. Edge of road is difficult to see at night. Driving dangers are increased.



White Concrete Reflecting Curb uses the car's headlights at night. Saw-tooth faces mirror the light back to the driver, form a continuous bright ribbon of light at the road's edge. Driving is safer.

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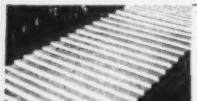

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ENGINEERING NEWS-RECORD

OCTOBER 27, 1949 VOL. 143 NO. 17

Many construction bills passed by 81st Congress

Public housing and advance works planning measures notable in first session work—Other important measures ready for action when Congress returns in January

During the nine and one-half months of its first session, the 81st Congress passed a score of laws with direct effects on engineering and construction—and of them the bills for public housing and advance planning of public works rank high.

Other measures of importance were held over to the next session, starting Jan. 3. Legislation should move faster then. All preliminaries are now out of the way. When Congress returns, it can start without delay exactly where it left off.

Public housing set the pace as the biggest construction measure to come out of the first session. The National Housing Act of 1949—approved last July (ENR July 7, p. 49)—may generate $8 to $10 billion of construction activity. It lets local public housing authorities start 810,000 low-rent dwelling units in the next six years. It also authorizes $1.5 billion in loans and grants for slum clearance.

Program reservations high

Under this law, public housing authorities in 170 localities by Oct. 20 had already obtained federal "program reservations" totaling nearly 215,000 dwelling units. Final drafting of contracts for financial assistance awaits completion of detailed plans for individual projects. Federal officials now estimate that construction will be started on 50,000 units by next July, and on 112,500 more new units by the end of 1950.

Ambitious plans to liberalize financing aids for private housing were held over until the next session. Sen. John J. Sparkman (Dem., Ala.) agreed to postpone action on his bill, reported favorably by the Banking Committee. Its most controversial provisions would authorize direct government loans to cooperatives and to veterans.

In its place, Congress passed a resolution extending present mortgage-purchasing arrangements to March 1. A record of nearly 750,000 dwellings started in the first nine months of this year made the need for new aids appear less urgent.

Separate legislation was enacted to encourage private construction of rental housing at military installations. The uncertain future of military posts frequently deters private investment. Under the new act, government insurance is authorized for $500 million of mortgages (on 90 percent of property value), sufficient to cover about 60,000 dwelling units. Effects of this law are still indeterminate; it may not achieve the results desired, according to some experts.

For Alaska, Congress passed a special housing act. This law makes allowance for higher construction costs and financing difficulties in the Territory. It authorizes a $15,000,000 revolving fund that the Alaska Housing Authority can use either to make loans to private projects or to build dwellings for sale or rent. The first session appropriated $10 million to this fund.

Alaska also got a $70,000,000 authorization (not an appropriation) to assist construction of needed local public works. The money can be used—when appropriated—to finance these public improvements. From 25 to 75 percent of the cost must be repaid.

After experiencing the chill of a brief recession, Congress finally passed a bill to resume the advance planning of non-federal public works. The previous program expired in 1947. In the last days of the session, the legislators authorized $100 million for loans to states and localities to plan useful

JURISDICTIONAL PEACEMAKERS—Reestablishment of arbitration machinery to handle jurisdictional disputes in the construction industry (ENR Oct. 20, p. 23) brought these industry-labor officials together. Seated at left is Richard J. Gray, president of the American Federation of Labor's Building and Construction Trades Department, beside James D. Marshall, assistant managing director, Associated General Contractors, with Paul M. Geary, executive vice president, National Electrical Contractors Association, at right. Standing, left to right, are Herbert Rivers, secretary-treasurer of the Building and Construction Trades Department; John T. Dunlop, impartial chairman of the National Joint Arbitration board; and H. R. Cole, executive secretary of the Tile Contractors' Association of America.

projects. Equally important, Congress quickly followed up with $8,000,000 in cash and $17,000,000 in contract authority to carry the program along until June 30. The $25,000,000 total could finance plans for $750 million of construction.

For planning new federal public buildings and acquiring sites, the first session authorized $40,000,000 to be used equitably for the benefit of all Congressional districts. The last appropriation bill before adjournment allotted $12,000,000 for this program in fiscal 1950.

Anti-CVA sentiment

Public works committees of both the Senate and House held hearings on Columbia Valley Administration bills. Additional hearings are planned at points in the Columbia Basin. Unless the disposition of the committee changes, there is small chance of their reporting CVA favorably, even though President Truman is for it.

Interior department officials, with notable exceptions, have been lukewarm about supporting CVA. The Reclamation Bureau and the Army Engineers brought out their joint, comprehensive plan for the basin as a stopper to the regional authority. The Senate Public Works Committee moved to add some of the reclamation projects to the omnibus rivers and harbors-flood control authorization bill, but withdrew them to let the Interior Committee pass on them.

The omnibus bill has been reported to the Senate by the Public Works Committee. It is expected that the Interior Committee will approve the reclamation projects and that they will be added to the bill by amendment.

Seek irrigation policy

Questions of irrigation policy also will come up in the Senate consideration of the omnibus bill. Several proposals—typified by the Grand Prairie plan in Arkansas—combine irrigation with flood control and drainage in one Army Engineer project. The President and the Reclamation Bureau want no irrigation works to be authorized until a national policy on repayment and acreage limitation is determined.

Bills proposing to divert federal-aid highway money to rural local roads came up for hearings during the first session. Highway officials urged that a thorough study be made of farm-to-market roads in relation to the entire highway problem before Congress takes any action. Pressure from rural areas will bring these bills up again.

A start was made on Point 4 legislation during the session. Bills outlining certain guarantees for American investors abroad were reported out by the Banking Committees of the two houses. The House Foreign Affairs Committee had before it a bill calling for $35,000,000 to furnish technical assistance to underdeveloped countries. Some action on these measures may be expected in the next session.

During its first session, the 81st Congress extended the Institute of Inter-American Affairs five years to June 30, 1955, and authorized $35,000,000 to continue its cooperative program in Latin America. That program in many respects is a prototype of what President Truman proposed under Point 4 for the rest of the world.

Legislation to create a National Science Foundation should be completed next year. A bill meeting the requirements of the President has passed the Senate and been reported to the House. It is in the Rules Committee.

Welding design tied to cost savings

Structures must be designed for welding with the definite intent of saving material, cutting fabrication costs and lessening erection expense if the full advantages of structural welding are to be realized. R. E. Robertson, Jr., of Saxe, William & Robertson, consulting engineers, Baltimore, developed this point before the structural session of the American Welding Society in Cleveland last week. And it found support in the three other papers that focused attention on more effective use of welding in bridges, buildings and subways.

Savings in material, in a design executed for welding, can amount to from ⅛ to ¼ of the total tonnage, said Mr. Robertson. But one of the most promising fields of reducing the costs of welded structures is to simplify present erection procedures and develop new ones—a job in which designer, fabricator and erector all have a part. Elimination of gusset plates aids truss designs, while the use of composite sections shows considerable promise of economy for girders, provided they are selected with due regard for the increased cost of certain mill-price extras.

Discussors emphasized that this was an important proviso since apparent cost savings in design through reduction of steel may disappear in the fabricating shop. Some unsymmetrical sections are so extreme as to present quite difficult fabrication. Designers of welded structures, it was pointed out, should give more thought to limitations of economical fabrication and erection, and not merely to savings in weight of steel.

New York City can save 40,000 tons of structural steel and $10,000,000 by using an all-welded rigid-frame type of bent for its proposed 250 track-miles of subway in lieu of riveted bents of conventional design, according to Martin P. Korn, consulting engineer, Dearborn, Mich. He said a potential design had been offered free to the city. The bents contain angular knee sections, without stiffeners, and can be mass-produced. Less excavation and more rapid erection are other advantages claimed over a riveted design.

One of the important welded structures of the year is an all-welded five-span continuous deck girder highway bridge at Iowa City, Ia., designed by Ned L. Ashton, associate professor of civil engineering, Iowa State University. Prof. Ashton pointed out that the prefabrication of curbs and handrails in 20-ft. sections greatly simplified erection. Another economical feature was the adoption of T-shaped stiffeners made of split H-beams with their webs welded to the inside face of girder webs.

The fourth paper, by A. T. Waidelich, assistant director of research, The Austin Co., Cleveland, described the strain gage tests on a pair of the company's standard 80-ft. all-welded H-section trusses, previously reported in ENR July 4, 1946, vol. p. 15.

O. B. J. Fraser, assistant manager, development and research division, International Nickel Co., New York City, is the new president of the American Welding Society. He succeeds G. N. Sieger, president, S. M. S. Corp., Detroit, Mich.

W. W. Towne appointed to water pollution post

With the appointment of W. Waldo Towne as chief basin engineer for the drainage area of the Ohio and Tennessee Rivers, the U. S. Public Health Service has filled the top technical posts in ten of the 14 basin areas that it created to carry out the nationwide program authorized by the Water Pollution Control Act of 1948.

Basin engineers of PHS work with the states and regional agencies in their areas to develop programs for the prevention or abatement of pollution in water resources. Thus Mr. Towne's office will furnish technical assistance to the states in his territory and will cooperate with the Ohio River Valley Water Sanitation Commission, and the Tennessee Valley Authority.

Need realism in public works plans, more feasible, integrated projects

American Society of Planning Officials conference hears plans for transport facilities, slum clearance, and industrial building needs

Public works planners must become more realistic in their approach to civic improvements. Proposed projects must be both feasible and integrated in well-conceived master plans for community development.

These observations were presented by Charles B. Bennett, Los Angeles' planning director, at a conference of the American Society of Planning Officials, at Cleveland, Oct. 10-12.

"Undoubtedly," Bennett declared, "there are many good planners who are pure theorists, and rightfully so, since theory supplies the groundwork for scientific advance. But those in charge of planning agencies, and planning consultants as well, should never feel their job is accomplished when they sign and deliver the blueprints. Theirs is the responsibility of continuing to sell the needs for each proposed project to the public—whether it be relief from traffic congestion; improved local transit facilities; slum clearance; housing; or the elimination of blighted residential, commercial and industrial facilities."

Now, as never before, concluded Bennett, planners are confronted with a challenge to produce sound, practical plans. For the first time in history, legal and financial tools are available to the planning profession—through the Federal Housing Act of 1949—for the orderly elimination of slum and blighted areas.

Better terminal facilities needed

Adequate terminal facilities—the hub of transport interchange—are of strategic importance in metropolitan development, declared Frank W. Herring, chief of the planning bureau, Port of New York Authority. At the same time, he said, there is seldom much latitude in the choice of terminal locations, especially those involving marine and railway transportation agencies and facilities.

In pointing out the significance of terminal characteristics to the community planning problem, Herring charged that too often the terminal problem is approached as though it were to serve only one facility such as a shipping line, a railroad, or a trucking line. Meagre attention, if any at all, is given to the complementary forms of transport. Inadequate facilities for interchange lead to inefficiency—congestion develops, transportation costs soar, and the economy and prosperity of the community suffer.

N. S. Keith, of the Housing and Home Finance Agency, called on planning officials for full support of the new federal program for slum clearance and urban redevelopment. Under the provisions of the Federal Housing Act of 1949, (ENR July 28, p. 26) this program can be as far-reaching in its impact on sound community growth as our abilities and resourcefulness will permit, he said.

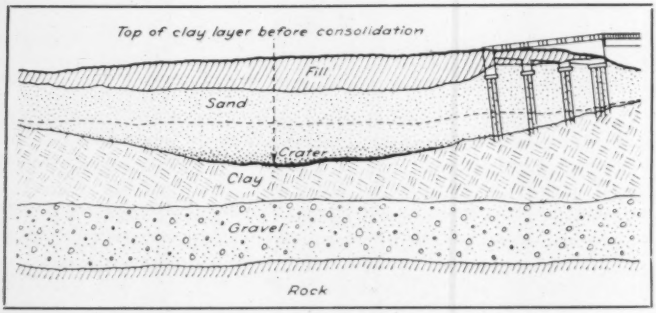
Fundamental responsibility for implementing and expediting this program of slum clearance and urban redevelopment, Keith declared, rests with communities. It is the intent of Congress, he said, that the program be founded on local initiative, local planning, and local operation. Offering all possible aid by his agency, Keith concluded his remarks by urging that redevelopment plans be sufficiently complete to show their proper relationship to definite local objectives. Basic points to be considered, he said, are: appropriate land usage and improved traffic; public transportation; public utilities; recreational and community facilities; reduced housing costs; improved housing standards; and prevention of the spread of recurrence of slums and blighted areas.

An industrialist's viewpoints on community planning were presented by C. F. Hood, President, American Steel and Wire Co., Cleveland. City planners should become better informed on industry's needs, he said—especially in terms of railroad and other shipping facilities, schools and shopping areas, mass transportation, hospitals and recreational facilities—all of which industry must consider in selecting locations for new plants.

Taking issue with the theory of extensive public works programs to combat unemployment, Hood declared that this expedient alone cannot be depended upon to level off employment. Public works may help stabilize the construction industry, he said, but no such program will provide a substitute for employment in private industry to produce the high-level economy desired and attainable in this country.

Rafael Pico, chairman of the Puerto Rico Planning Board, was elected president of the American Society of Planning Officials, succeeding Charles B. Bennett. Ernest J. Bohn, chairman, City Planning Commission, Cleveland, Ohio, was elected vice-president, succeeding Charles S. Asher, chairman, Political Science Department, Brooklyn College. Newly elected directors of the society are: A. E. K. Bunnell, Toronto, Canada; Ladislas Segoe, Cincinnati, Ohio; and Bennett.

BUILT-IN LIGHTING—About 20,000 units of it—will illuminate 24 floors of Boston's John Hancock Life Insurance Building, tallest New England structure (ENR Feb. 17, p. 65). Recessed in acoustically treated ceilings, units fit into 4- and 8-ft. long openings, shielded by louvers, and furnish an average of 45 footcandles.



New D.C. bridge abutment settles

The District of Columbia Engineering Commission has notified contractors to change their contracts because of settlement of Washington's new 14 Street bridge across the Potomac.

The abutment on the District side has been found to be tipping landward from the river.

After detailed investigation by District engineers, soils engineers of the Bureau of Public Roads and the Office of the Chief of Engineers, the Bethlehem Steel Co. (superstructure contractor) was notified to make a change order in its contract to provide for underpinning the continuous, plate-girder structure.

The underpinning will be done at six locations on each side-wall of the abutment. Two needle beams, each supported by two bearing piles driven outside the wall lines, will take the load off the existing friction-pile clusters. Three rows of bearing piles will carry fourteen needle beams under the abutment's front wall, and four more pile pairs will support beams under an interior curtain wall.

Reporting on the settlement, engineers for the District said that as of May 3, 1949, the landward end of the U-type, sawn-granite-faced abutment had settled 1.14 ft. below original design grade. The river-ward end had settled 0.11 ft. below its elevation.

Engineers said that the whole abutment rests on friction piles about 40 ft. long, with a butt diameter of 14 in. These piles were driven to a bearing value of 50 tons, according to Engineering News formula, during April and May of 1948. Construction of the abutment proper was started in June of 1948 and the abutment was ready for steel superstructure in November 1948.

During the construction period, repeated checks were made on various courses of stone and at other points, and no signs of movement were detected. However, while construction of the abutment was taking place, the entire approach area to the bridge was being filled with excavated material from another project in Washington. By April of 1949, this fill near the abutment was built up to its present elevation of about 17 ft. above original ground, thereby adding a load of about 1 ton per square foot of area.

Borings taken prior to the construction indicate that the abutment rests on a layer of sandy clay, underlain by a layer of softer clay. Since the sand clay is almost incompressible, by comparison with the soft clay, the settlement is believed to have been caused entirely by compression in the deep-seated clay stratum. As the fill progressed after the completion of the abutment, the additional weight of the overburden is believed to have caused this deep compressive layer to consolidate to form a depression in the clay stratum under and around the fill.

The soils engineers checking these conclusions estimated that total settlement to be expected at the north end of the abutment would be about 2 ft., at the south about 8 to 10 in.

Engineers estimate that the underpinning and straightening work will cost about $150,000, with the District of Columbia paying half and the Bureau of Public Roads the remainder on this federal-aid project.

Correcting the condition is expected to delay completion 90 days.

Morton chief engineer of N. H. highway staff

John O. Morton has become chief engineer for the New Hampshire state highway department, in Concord. For the last several months, he had been resident engineer for Parsons, Brinckerhoff, Hall and Macdonald on construction of the 15-mi. New Hampshire Turnpike, $5,500,000 four-lane toll road that parallels U. S. 1 a few miles inshore from the state's Atlantic shore.

Morton was graduated from the University of New Hampshire in 1925, and he completed master's degree work in soil mechanics at Massachusetts Institute of Technology in 1929. Except for a year spent with the George A. Fuller Co. in Florida, he spent the rest of his time before World War II with the New Hampshire state highway department. He spent several months with the Navy during the war, as a consultant on design, particularly for air stations in New England. In 1944, Mr. Morton returned to the state highway department and in 1946 he established a concrete aggregate business at Berlin, N. H.

Magnel here for tests on prestressed bridge

Prof. Gustave Magnel, Belgian consultant on construction of Philadelphia's Walnut Lane Bridge—first prestressed concrete bridge in the United States (ENR Dec. 30, 1948, p. 16)—arrived in New York last week to witness tests on a full-size girder for the bridge.

Shortly after his arrival, Professor Magnel, as guest speaker at a meeting held at Columbia University, told of studies made in his laboratories at the University of Ghent, leading toward the first use of prestressed concrete in the continuous framing of multistory buildings. Prestressed concrete beams already have been incorporated in multistory structures, but framing was of convention reinforced concrete in these buildings.

Continuous prestressed concrete beams, he said, also are being used in the Meuse River bridge at Sclayn, Belgium (ENR March 24, p. 20). The two spans, each 200 ft. long, that are used in the bridge, are now near completion. The prestressing operation was designed and supervised by Professor Magnel.

The Columbia lecture was sponsored jointly by the Junior Branch, Metropolitan Section of the American Society of Civil Engineers and the civil engineering department of Columbia.

Los Angeles maps schools

Los Angeles is planning a $41,000,000 school expansion including nine elementary and three junior high schools and two junior colleges. Between $6,000,000 and $7,000,000 will be spent on one junior college to be completed by 1953 in the city's Harbor district.

World development success seen tied to effective sanitation pioneering

Dean Fair tells Federation of Sewage Works Associations that "Point Four" will succeed only if sanitation is advance guard of programs

By J. C. Bumstead
Associate Editor

Point Four of President Truman's "bold new program" will succeed only if sanitation is recognized as the essential "advance guard" for developing the world's backward areas.

The eradication of malaria—by wiping out Anopheles gambiae and Anopheles labranchaie (mosquitos) from northeastern Brazil and Sardinia, respectively (now in progress)—were cited as successful pioneer sanitary achievements along this line by Dean Gordon M. Fair, of Harvard's Graduate School of Engineering.

Dean Fair, who addressed the Federation of Sewage Works Associations at Boston, last week, also cited the Rockefeller Foundation, the Institute of Inter-American Affairs and the World Health Organization for sanitation-consciousness.

Backward-area sanitation should embrace as its goals, he recommended, not only checking and eradication of debilitating diseases but also eradication of their causes or causative organisms."

"We have kept cholera from our shores for many decades. But why," he demanded, "should the cholera vibrio be permitted to survive as a menace to a world in which speed of modern transportation has destroyed the time barrier to a renewed dissemination of this scourge? Why should intestinal parasites be allowed to make of our globe a wormy world?"

Scientific cooperation needed

In accepting this challenge, sanitary engineers, chemists, and biologists, he declared, must act with all the freedom and independence of judgment that their individual professional status guaranteed them. These scientists must not permit themselves to be welded into a new, self contained, public health profession "protected by a ritualistic system of training, occupational advancement and accreditation."

Another discussion explored the controversial subject of bacterial standards for natural waters. Abel Wolman, of the Johns Hopkins University, declared that a sharp distinction should be made between standardization of methods for diagnostic application and standardization of practices or concepts. The former, he said, are the required tools which possess both uniformity and interchangeability of technical language, while in the latter, the "criterion of judgment is introduced and must loom large in final decisions."

"When one attempts to standardize judgment by developing convenient and often illogical devices as a substitute for reasoning," Wolman said, "nothing but confusion is likely to result. Many workers seek and use 'handbook criteria' injudiciously."

To attempt to bring order out of this confusion, Dr. Wolman suggested that the Federation pursue these objectives:

1. Participate officially with other voluntary associations in discussions of the general validity of judgment standards.

2. Participate with both voluntary and official agencies in discussions of judgment standards which such agencies perceptuate.

3. Evaluate in selected areas of the United States the results of sewage treatment plant installations with particular respect to bacterial accomplishments first sought.

4. Appraise realistically the practicability of actually using a wide variety of stream bacterial standards which have already been translated either into law or administrative rule.

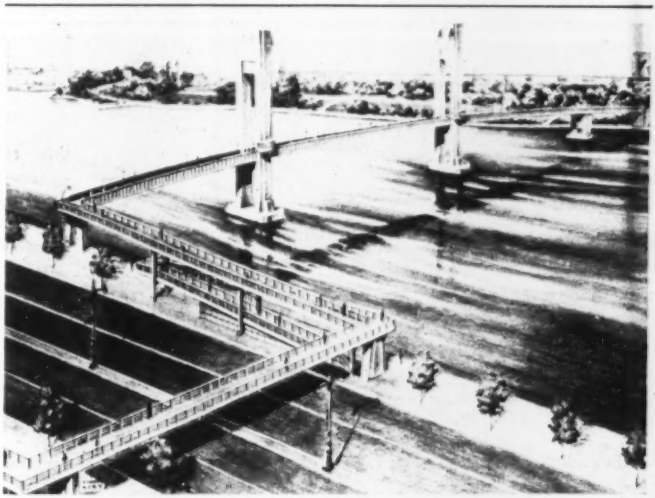
Awards and new officers

The George B. Gascoigne medal for outstanding contribution to sewage works operation was awarded to W. N. Torpey, civil engineer, New York City Department of Public Works.

The Harrison P. Eddy award for outstanding research was presented to John W. Hood, superintendent of sewage treatment, Ridgewood, N. J.

Specially cited for long and distinguished service to the Federation was W. J. Orchard, general manager of Wallace and Tiernan Co., Inc., Newark, N. J. This presentation was made by C. A. Emerson, first president of the Federation.

New officers include: President—A. H. Niles, superintendent of sewage disposal division, Toledo, Ohio; Vice-President—R. E. Fuhrman, superintendent, Blue Plains sewage treatment plant, Washington, D. C.; Treasurer—W. W. DeBarard, city engineer, Chicago.



FOOTBRIDGE WITH A LIFT—Unique among New York's many over-water structures will be this $2,000,000, 956-ft. plate-girder pedestrian footbridge across the Harlem River, for which ground was broken Oct. 14. Connecting uptown Manhattan (at 103rd St.) to a huge recreation center on Ward's Island, the four-span steel structure will include a 330-ft. lift span to give a maximum 135-ft. clearance for busy river traffic. (Present access to the island is by the Triboro Bridge, more than a mile to the north.) The lift span will be supported on concrete piers carried to firm bottom about 80 ft. below water level. Builder is the Triboro Bridge and Tunnel Authority, for whom Amman and Whitney are consultants. Contracts have been awarded to: Grow Const. Co., Inc., substructure and ramp approaches; American Bridge Co., superstructure.

Wartime bridge casualty replaced in Maryland

A $4,000,000 bridge has replaced a seven-year-old ferry service across the Chesapeake and Delaware Canal at Chesapeake City, Md.

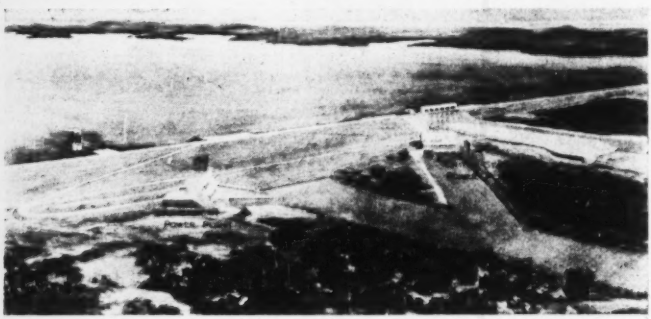
Dedicated recently, the high-level fixed bridge replaces a lift bridge which was destroyed in 1942 when a tanker crashed into its south pier. The government-supplied ferry service which replaced the old bridge has cost $250,000 yearly. Neither ships nor vehicles will be delayed any longer, though, and Delmarva peninsula traffic will be speeded by as much as an hour.

The new, two-lane highway bridge was begun in 1946. It's nearly 4,000 ft. long, has a 25-ft. roadway with a 4-ft. sidewalk. It main span is 540 ft. long and has a 135-ft. clearance at mean high water. Substructure was built by Fehlhaber Pile Co., New York; the superstructure by American Bridge Co., Pittsburgh; and the approaches by George and Lynch, Wilmington, Del. Parsons, Brinckerhoff, Hall and MacDonald were designing and supervising engineers. The Maryland Roads Commission will maintain the bridge.

Next step in the Army's program to obtain full use of the canal will be the completion this month of night lighting. In its drive for full economic utilization of the canal, the Engineers are replacing lift bridges by high-level fixed bridges. That just dedicated is the second replacement for a bridge destroyed after being hit by a ship.

In 1939, a steamer wrecked the lift span of a bridge crossing the east end of the canal at St. Georges, Del. The bridge was replaced with a high level structure 4,200 ft. long giving 135 ft. clearance. The canal crossing is a 540-ft. stiffened tied-arch span of a type then new to American practice (ENR Jan. 1, 1942, p. 22). The bridge is on the Du Pont Expressway.

The 1942 tanker crash wrecked the Chesapeake City bridge at the canal's west end. The replacement bridge is a duplicate in design and span length of the St. George's bridge, but has only two lanes instead of four. An article on the Chesapeake City bridge piers, which featured air-entrained cement and absorptive form liners, was printed in ENR Feb. 5, 1948, p. 174.



U. S., Mexico start Falcon Dam on Rio

Approval of plans by the U. S. and Mexican governments has given the go-ahead sign to construction of Falcon Dam—first international multipurpose project for the Rio Grande.

The International Boundary and Water Commission will build the $33,400,000 rolled-earth dam 75 miles below Laredo, Tex., under authorization granted by 1944 the water treaty.

The 150-ft. high structure will be 26,294 ft. long and will create a reservoir with a capacity of 3,300,000 acre-ft. There will be two power plants, one on each side of the international boundary which runs down the center of the river's channel. Power will be divided equally; each power station will contain three generators of 10,500 kw. capacity. Cost of power plants will be near $46,000,000.

Conservation storage capacity of the reservoir is to be divided between the two countries on the basis of the 1944 pact. This provides that 58.6 percent of the irrigation water is to be allocated to the United States and 41.4 percent to Mexico. Urgent need of this water on both sides of the border requires that the dam be completed by November 1953. Commissioners of the International Boundary and Water Commission will have no jurisdiction over use made of the waters after division between the signatory powers has been effected.

Commissioners having charge of the project are: L. M. Lawson for the United States, and David H. Jordan for Mexico. C. M. Ainsworth is principal engineer for the U. S. Others on the U. S. half of the commission staff are: L. N. McClellan, chief engineer, Bureau of Reclamation; W. H. Nalder, chief designing engineer, Bureau of Reclamation; H. G. Arthur, engineer, Bureau of Reclamation; Col. Henry Hutchings, Jr., Corps of Engineers; R. J. Tipton, consulting engineer; and Walker R. Young, consulting engineer.

More power at Niagara proposed by commission

Generation of an additional 1,127,000 kw. on the American site at Niagara Falls through better utilization of the available water is proposed by the Federal Power Commission. This would add 7.9 billion kw-hr. to the dependable energy of the Buffalo-Niagara region.

The additional power would be generated in a new power station to be built in the lower end of the Niagara River gorge near Lewiston where 317 ft. of the total drop of the 326 ft. between Lakes Erie and Ontario can be developed. This plant would be supplied with water from two sources, an intake in the upper part of the gorge below the tailrace of the Schoellkopf power station of the Niagara Falls Power Co., and a second intake above the falls. Thus the great Schoellkopf station could be operated while useful. It develops 215 ft. of head.

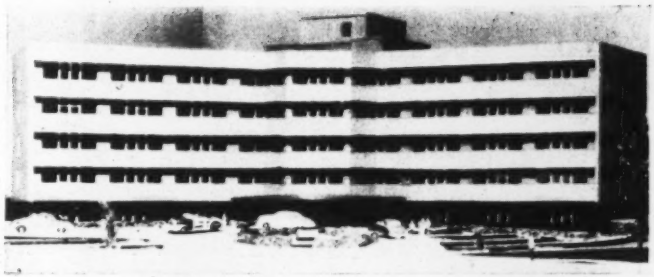
Old plant for standby

The old Adams plant, which develops only 135 ft., would be kept for standby use. Water now used there and water used in old plants on the Canadian side to develop power exported to the United States would be diverted from the river above the falls and carried by covered canal or tunnel to the new Lewiston plant where it can be used for power generation much more efficiently.

Under the International Boundary Waters Treaty of 1909, diversion of 20,000 cfs. on the New York side and 36,000 cfs. on the Ontario side of the river was authorized. Since 1940, under temporary agreements, additional diversions totaling 12,500 cfs. in the United States and 18,000 cfs. in Canada have been authorized, including 5,000 cfs. to compensate for 5,000 cfs. diverted by Ontario into Lake Superior from the Hudson Bay drainage. Meanwhile, a low weir was built above the falls to redistribute the flow over the falls to facilitate additional diversions without serious effect on the falls' scenic value.

FPC's report anticipates a new treaty to equalize the diversions. It also recommends control gates at the outlet of Lake Erie and the construction of a pumped-storage unit in connection with the proposed Lewiston station.

The total cost of the proposed new work on the New York side is estimated to range from $308,700,000 to $350,300,000, depending on whether a covered canal or tunnels are used to carry water from above the falls to Lewiston.



ALUMINUM PANELS will make up exterior of Bradford, Pa., hospital and make it the second building of its type to be completed. Alcoa used cast aluminum panels first on its Davenport, Iowa, office building (ENR June 9, p. 66). The hospital will have five stories, 200 beds; cost $1,800,000 and be finished in 1951. Castings have lightweight concrete back-up.

Construction equipment not yet hurt by strike

The steel strike hasn't yet hurt makers of construction equipment very much, the Associated Equipment Distributors reported last week.

An AED survey declared that less than 15 percent of construction equipment manufacturers have already been pinched by the strike. Cutbacks thus far have been minor. But the survey showed that if the strike continues beyond Dec. 1, a majority of manufacturers would probably have to cut production schedules by 50 percent or more.

Inventories of construction equipment are reported sufficient to meet present needs, AED said. It added that an overwhelming majority of manufacturers intend to continue production at present rates. Only 4 percent had cut production as much as 50 percent by Oct. 17.

AEC pushes $300 million A-bomb production works

A forced-draft construction project for more A-bomb production facilities is underway at the order of President Truman and the Atomic Energy Commission. The program will cost more than $300 million.

AEC is getting a three- to six-months' head start by allocating $30,000,000 now, without waiting for normal appropriations routine. Plans have been shaping since last spring (ENR April 28, p. 29), but they weren't ready before Congress' adjournment last week. Congress, though, gave AEC a go-ahead in its last two days of activity by amending a current appropriation bill. This authorizes AEC to undertake any project it deems necessary.

Matilija Dam approved by Calif. authorities

The California Division of Water Resources has given official approval to the $3,000,000 Matilija Dam in Ventura County, Calif., concluding a fiery controversy over the safety of the structure begun in Matilija canyon in 1946.

Earlier this year a five-month hearing ended with Superior Court approval of the dam's structural safety (ENR June 23, p. 34). It was designed by Donald R. Warren Co., Los Angeles.

Since the long-drawn out trial, county officials have submitted final tracings of the structure and the state division of water resources has approved Matilija Dam as safe for use to the full extent of its storage.

Anson Marston, ex-ASCE head, dies in auto accident

Anson Marston, 85, dean emeritus of the engineering college, Iowa State College, Ames, and former president of the American Society of Civil Engineers, was killed in an automobile accident near Tama, Iowa, Oct. 21.

Los Angeles strike ends

Threats to Los Angeles construction were gone this week as AFL operating engineers resumed work at 15 aggregate companies they struck Oct. 3 (ENR Oct. 20, p. 25). The surprise settlement sent 500 quarrymen back to work Oct. 24.

The settlement brought a 2.5 cents hourly wage boost and paid vacations to workers with two years' service. A union demand for six paid holidays was refused.

Mexico to go ahead with construction of Falcon Dam—first international multipurpose project for the Rio Grande.

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CONSTRUCTION BUSINESS

Construction money tops '48 by 24%

New money to finance heavy construction is now running 24 percent ahead of last year, following a plethora of federal appropriation measures pushed through Congress last week.

The Interior Department got $437.9 million for construction, and Defense got $688.5 million. This brought to $1,748,224,000 total federal funds slated to go into heavy construction during the current fiscal year. Interior's budget for construction was increased 59 percent over last year's. Defense took about a three percent cut from last year's figure.

The figures show, however, that in the year to come state and municipal contract volume will probably be a bigger factor in maintaining a high level of heavy construction than federal work. State and municipal money now is running 63 percent ahead of last year, while the $1.7 billion federal funds top fiscal 1949 appropriations by a little less than 15 percent.

All private capital invested in construction this year through security sales, both by corporations and by local governments, totals $4.4 billion in late October. This is 35 percent above the figure for a year ago. In addition, $385,000 federal-aid to state highway programs will bring the funds available for non-federal construction to $4.8 billion, 27 percent more than the total a year earlier. This, plus the $1.7 billion federal money, totals nearly $6.5 billion earmarked for heavy construction so far this year, an increase of 24 percent over the figures of a year ago.

Corporations have borrowed nearly $2 billion to date this year for expansion and modernization of their production facilities, a major portion of which came from bond and stock sales by utilities. Although business demands for construction money are not running as high as local governments', the total corporate security sales for the former now is 10.5 percent above last year.

Lumber orders top output

Douglas fir lumber orders have exceeded production for six successive weeks, the West Coast Lumberman's Association reports, which may mean some fir items will be less plentiful in the near future. During September the mills accepted orders for 18 million board feet a week more than they produced. At the end of the month unfilled orders were up 12 million board feet to 584 million, and mill stocks were lower than they had been in years.

Utility expansion plans about half completed

Electric utilities' $9 billion postwar expansion program due to wind up in 1951, is now about half completed and about 60 percent of the financing has been arranged, Elmer L. Lindseth, president of the Edison Electric Institute, declared Tuesday at a New York press conference. He also said, "The electric utility industry . . . is anxious to continue its growth at the same pace in the next two to three decades, if the nation's 'economic climate' permits." Of financing that has been completed $2,265,000,000 expansion money has come from utilities' internal sources of cash, $2,100,000,000 from the sale of bonds, $435,000,000 from the marketing of preferred stocks and $585,000,000 from the sale of common stocks.

Of the remaining $3,615,000,000, $1,500,000,000 will come from internal sources, and $2,115,000,000 from the sale of securities.

Rise in highway traffic

Virginia State Highway Department's traffic report for fiscal 1949-50 shows: (1) Travel on primary highways increased almost 10 percent over the previous year, and almost 40 percent over the peak prewar year of 1941. (2) In the ten years since 1939 traffic on Virginia's highways has increased 71 percent, passenger vehicle traffic 74 percent, out-of-State passenger traffic 50 percent, light and medium trucks 73 percent, and tractor-trailers and buses 117 percent.

Highway grading volume

Grading operations take from 15 to 19 percent of the highway dollar, according to the records of the Bureau of Public Roads. In 1948, 18.7 percent of the total value of contracts awarded for federal-aid highways went into grading. In the first half of 1949, 15.6 percent of the contract value went into grading.

$2,000,000 road equipment

For road building by the Iranian Government, or to be let to Iranian contractors, Overseas Consultants, Inc. makes a recommendation for the purchase of $2 million worth of road-building equipment.

This is part of the $650 million internal development program to be directed by Overseas Consultants, Inc., New York.

Units	Equipment	Est. Cost
10	Hvy. bulldozers (sim. to Caterpillar #8)	$180,000
10	Med. bulldozers (sim. to Caterpillar #6)	108,000
90	5-7½ ton dump trucks	594,000
15	Motor graders (sim. to Caterpillar #12)	210,000
15	Grader elevators	97,500
15	Port. rock crushers, 25-30 tons per hr.	120,000
15	Road rollers 8-12 ton	120,000
15	1½ ton trucks, ken'l	54,000
10	Mobile air compressors	45,000
2	Liq. asphalt sprayers, 1,000 gal. tank	20,000
	Spare parts for above	200,000
	Misc. matl. and equip. rails, ties, tunnel cars, wheelbarrows, picks, shovels, expl.	251,500
Total		$2,000,000

Highway bids on decline

Average bid-prices for the basic items used in Federal-aid highway construction for second-quarter 1949, are lower in a majority of cases. The exceptions are borrow roadway excavation, Portland cement concrete bases in place, and cast iron pipe. These figures are prepared by the Bureau of Public Roads, General Services Administration.

Average Bid Prices for Federal-Aid Highway Construction

Classification	2nd /4 1949	1st /4 1949	Aver. 1948
Roadway excavation:			
Borrow, cy	$0.66	$0.63	$0.55
Common cy	0.33	0.35	0.36
Unel. cy	0.43	0.51	0.46
Rock, solid cy	1.33	1.54	1.21
Struct. excavation:			
Common, dry cy	3.03	3.08	3.31
Unel. cy	3.74	4.56	3.37
Steel:			
Pave. reinf. lb	0.078	0.079	0.072
Struc. reinf. lb	0.105	0.118	0.107
Struc. steel lb	0.142	0.155	0.140
Bases, in place: sy			
Grav. & el. grav.	0.41	0.43	0.39
Port. cem. concr.	3.55	3.22	3.08
Macad. or stone	0.97	1.13	0.92
Surf., in place: sy			
Grav. & el. grav.	0.15	0.15	0.15
Port. cem. concr.	3.18	3.35	3.32
Bitum. surf.	0.25	0.26	0.30
Bitum. road mix.	0.44	0.60	0.61
Bitum. intermed.	0.72	0.72	0.78
Bitum. concrete	0.98	1.10	1.07
Pipe: lf			
C. I., 18-inch	13.31	9.37	9.96
Clay, 6-inch	0.98	1.10	1.17
Concr. reinf., 24"	5.11	5.36	5.19
Galv. iron, 24"	4.64	4.74	4.63
Struct. concr: cy			
Superstructures	47.13	47.29	50.60
Substructures	45.37	47.58	46.70
Found. & foot	41.43	48.59	47.48

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The total cost of the proposed new work on the New York side is estimated to range from $308,700,000 to $350,300,000, depending on whether a covered canal or tunnels are used to carry water from above the falls to Lewiston.

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The settlement brought a 2.5 cents hourly wage boost and paid vacations to workers with two years' service. A union demand for six paid holidays was refused.

BIDS AND BIDDERS

(Major project news received after Construction Reports, page 82, went to press.)

Army Housing—Department of the Army is soliciting proposals to construct private rental housing, including 100 units for Valley Forge General Hospital, Phoenixville, Pa., 200 units at Fitzsimmons General Hospital, Denver, Colo., and 500 units at Ford Ord, Calif. Other projects on which similar bids will soon be asked are 125 units at Atlanta General Depot, Atlanta, Ga., 800 units at Fort Benning and 225 units at Fort McPherson, all in Georgia; 500 units at Fort Sill, Okla.; 500 units at Fort Sam Houston and 60 units at William Beaumont Hospital, Houston, both in Texas; and 350 units at Fort Belvoir, Va. Bids are being taken Nov. 30 for constructing, financing and managing 600 units at Fort Benning, Ga.

Garrison Dam and Reservoir—Peter Kiewit Sons Co., Omaha, Neb., and Morrison Knudsen Co., Inc., Boise, Ida., were low bidders for Stage 3, Garrison Dam and Reservoir, North Dakota, at $5,740,500. U. S. Engineers, Lincoln, Neb., opened bids. Their estimate on the dam and reservoir project was $5,434,181.

Apartment—Thompson Starrett Co., Inc., New York, N. Y., has been awarded contract by Lancamp Realty Corp., St. Louis, Mo., to build 15-story apartment in St. Louis, Mo., to cost $3,500,000. Candela & Resnik, New York, are architects. Wells & Wells, Inc., St. Louis, Mo., is doing the engineering work.

Gas Pipe-Line—Arkansas Louisiana Gas Co., Shreveport, La., awarded contract for 91 miles pipe-line between Magnolia and Peria, Ark., to Latex Construction Co., Houston, Tex.; 72 miles between Marshall, Tex., and Columbus County, Ark., to Anderson Brothers Corp., Houston, Tex., and crossings at Red and Wichita Rivers to Omaha Dredge & Dock Co., Omaha, Neb., at about $7,900,000.

Housing—Lorain City Metropolitan Housing Authority, Lorain, O., plans constructing housing project at Lorain to cost $5,000,000. Lewis Gandell is city engr.

Agricultural Center—Cia Dysca, San Juan de Letran, Mexico City, Mexico, plans agricultural center at El Tulillo, Vera Cruz, Mexico, at about $36,500,000.

Diesel Engine Plant—Ertl Construction Co., Ltd., Hamilton, Ont., has been awarded contract to construct diesel engine plant at London, Ont., for General Diesel Motors Co., London. Estimated at $5,000,000.

Apartments—Jonathan Woodner Co., Washington, D. C., has been awarded contract to build Rock Creek Plaza Apartments by Ian Woodner, at Washington, D. C., to cost $5,000,000. Wallace F. Holladay, Arlington, Va., is architect.

University Buildings—Dayton University, Dayton, O., plans long-range expansion program at university with total cost of $15,000,000.

Housing—San Antonio Housing Authority, San Antonio, Tex., plans 3,000 low-cost units, cost $20,000,000.

Lucky Peak Dam Tunnel—Puget Sound Bridge & Dredging Co., Seattle, Wash., and Macco Corp., Paramount, Calif., were low bidders on concrete lined steel tunnel, transition section, Lucky Peak Dam in Idaho at $1,169,755. U. S. Engineers, Boise, Ida., opened bids.

Bridge—State Highway Department of Tennessee, Nashville, will take bids after Jan. 1 for constructing bridge over Cumberland River, near Nashville, Davidson County, to cost $2,500,000.

Hospital—Eden Township, Hayward, Calif., will hold election Nov. 8 to vote $2,600,000 bonds for hospital. Douglas D. Stone and L. B. Mulloy, San Francisco, are architects. Garthorne, Buonaccorsi & Murray, San Francisco, are engineers.

Housing—City of Boston Housing Authority, Boston, awarded contract for veterans housing project at Brighton, Mass., to John Bowen Co., Boston, Mass., $2,347,000. Stewart Associates, Inc., Cambridge, Mass., is engineer. T. F. McDonough, Boston, is architect for the project.

North Point Sewage Treatment Plant—Charles L. Harney, San Francisco, Calif., was low bidder at $1,041,163 for influent and effluent sewers at North Point Sewage Treatment plant, when Department of Public Works, San Francisco, Calif., opened bids. Ralph Wadsworth is in charge of the work for the city.

University Buildings—Southern University, Scottsville, La., plans group of university buildings, $7,450,000.

COSTS AND VOLUME

ENR INDEX NUMBERS

Index Base	100	1913	1926
Construction Cost	Oct. '49	880.42	230.94
Building Cost	Oct. '49	353.52	191.10
Volume	Sept. '49	291	128

Activity This Week

As reported to ENR (in millions of dollars)

Amount of Contracts let

	Week of Oct. 27 1949	Cumulative 1949 (43 wks.)	Cumulative 1948 (44 wks.)	% chge av.wk.
Federal	$7.7	$873.0	$825.3	+8
State & Mun.	55.5	2,662.0	2,232.3	+22
Total Public	$63.2	$3,535.0	$3,057.6	+18
Total Private	72.7	3,189.6	2,867.1	+14
U. S. Total	$135.9	$6,724.6	$5,924.7	+16

Contracts by type of work

	This Week	Cumulative 1949 (43 wks.)	Cumulative 1948 (44 wks.)	% chge av.wk.
Waterworks	$5.5	$178.3	$169.3	+8
Sewerage	7.1	225.2	192.9	+19
Bridges	6.5	290.3	243.6	+22
Highways	15.7	783.6	872.4	−8
Earthwork, Waterways	4.5	448.6	439.8	+4
Buildings, Public	18.8	1,350.9	949.5	+46
Industrial	11.7	854.3	947.7	−8
Commercial	49.6	1,967.9	1,564.8	+29
Unclassified	16.3	625.5	543.8	+18

NOTE: Minimum size projects included are: Waterworks and waterway projects, $28,000; other public works, $50,000; industrial buildings, $68,000; other buildings, $250,000.

New capital for construction

	Cumulative 1949 (43 wks.)	Cumulative 1948 (44 wks.)	% chge av.wk.
NON-FEDERAL	$4,869.6	$3,857.3	+29
Corporate Securities	1,974.7	1,824.5	+11
State and Municipal	2,569.9	1,540.0	+67
U. N. Building Loan	....	65.0	...
Federal-Aid Highway	385.0	427.3	−8
Federal	1,748.2	1,558.9	+15
Total Capital	$6,617.8	$5,416.2	+25

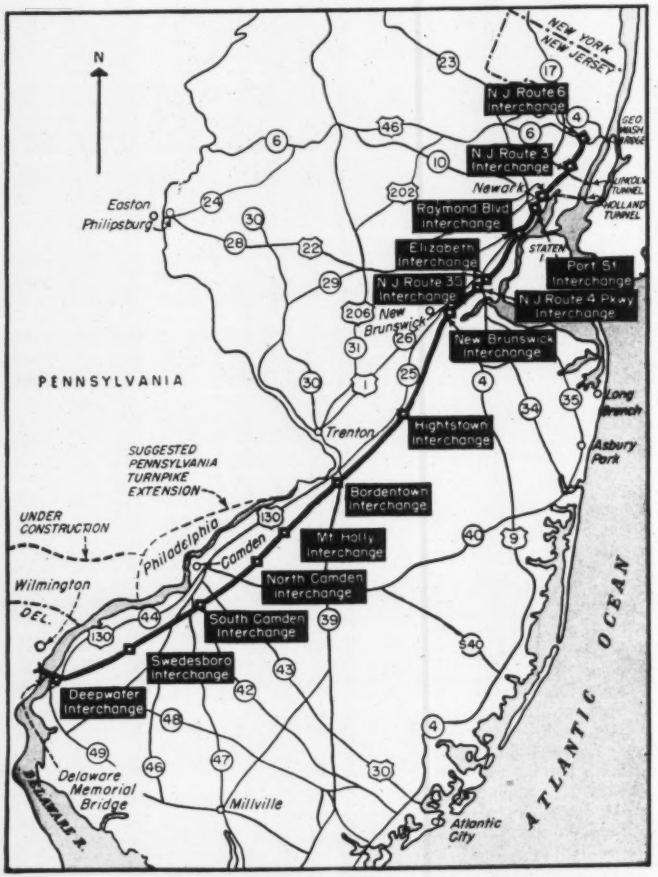
Fast Construction Scheduled For New Jersey Toll Turnpike

AN UNPRECEDENTED construction schedule has been set up for New Jersey's proposed 118-mile toll turnpike, which is rapidly approaching the bond-selling stage. If satisfactory offers are received for bonds to provide the $230,000,000 required to build the highway, eight engineering organizations stand ready to push work on final plans for the seven sections into which the highway has been divided to facilitate fast work. One of these organizations is an association of three engineering firms, hence the work actually will be spread among ten engineering offices. In this way it is planned to have some of the work under contract before the end of this year and all grading and foundation work in progress early next spring. Completion of the entire work is set for November 1951.

This two-year construction schedule is predicated on the fact that the cost is going to be so high, averaging more than $1,500,000 a mile, and that interest charges on the borrowed money will run to nearly $20,000 a day. Hence it is necessary to put the new facility on an income producing basis at the earliest possible moment after the borrowing takes place.

An act setting up the New Jersey Turnpike Authority and authorizing it to build such toll highways as met with the approval of the legislature was passed in October, 1948, and in the latter part of March of this year the authority was set up under the chairmanship of Paul L. Troast, a prominent New Jersey contractor. Within a month the authority has selected a route for its first project and had received legislative approval of its location.

In May, Charles M. Noble, chief engineer of the State Highway Department, was loaned to the authority to become its chief engineer. Immediately thereafter the authority engaged two engineering organizations to make the preliminary engineering studies and cost estimates and another firm to make the traffic and revenue studies, instructing them to have their reports in by the middle of September. A fourth engineering firm was engaged to act as general consultant to the authority and to review and certify the reports of the other consulting engineering firms.



NEW JERSEY'S TOLL TURNPIKE will provide a high-speed highway through the central part of the state from the New York metropolitan district to the new bridge now being built over the Delaware River below Philadelphia.

Contractors lined up

Meanwhile, an announcement was made by the turnpike authority that all construction work was to be let by contract and that as contractors would be required to prequalify, all interested firms should get the necessary clearances at once in the hope that some of the contracts could be let late this year.

Discussions looking toward the sale of bonds to finance the project were begun as soon as the engineers' estimates of the cost and their computations of potential income from the expected traffic and service facilities were in the hands of the turnpike authority. It is now expected that the bonds will be sold in the near future. Until they are sold, no purchases of right-of-way can be made, but the State Highway Department already has purchased

about ten miles of right-of-way along part of the route that the new turnpike is expected to follow.

Route of the turnpike

A route running northeast across the state from the new toll bridge now being built over the Delaware River below Wilmington to connections with the main Hudson River crossings at New York was selected for the turnpike, as shown on the accompanying map. Such a highway will serve both the traffic moving north and south along the Atlantic seaboard and in addition will provide a new high-speed north-south route through the metropolitan section of northern New Jersey. It will pass close to Camden, near enough to provide short connections to that city and Philadelphia.

North of the point where the highway crosses the Raritan River on a fixed bridge below New Brunswick it will intersect New Jersey Route 35, one of the main seashore routes. Still farther north, the highway will pass through the eastern edge of Elizabeth and Newark, closely parallel to the present U. S. Route 1, with interchanges to serve Newark at both Port Street and Raymond Boulevard. It then is to pass under the Pulaski Skyway and over both the Passaic and Hackensack rivers on fixed spans. Continuing as an elevated highway it will pass over New Jersey Route 3, where there will be an interchange for traffic to and from the Lincoln Tunnel. At its intersection with Route 6 an interchange will be provided for traffic to and from the George Washington Bridge.

The plan to carry the turnpike under the Pulaski Skyway, which crosses both the Passaic and Hackensack rivers with underclearances of about 135 ft., made it necessary for the turnpike authority to apply to the Department of the Army for permission to cross the rivers with an underclearance of 110 ft., above mean high water. Hearings on this application have just been held but no decision has been announced.

Future possible connections

Ultimately the turnpike may be extended north to the New York State line for a connection with the projected Catskill Thruway, but that extension is not included in the present work.

No provision is being made now for a direct connection with the extensions of the Pennsylvania Turnpike in the neighborhood of Philadelphia, but it is expected that ultimately such a connection will be made.

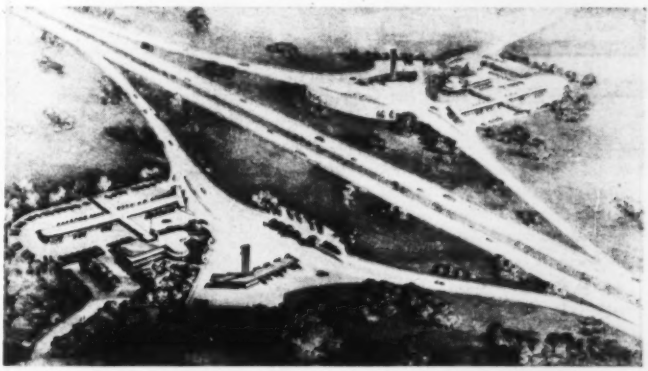
From the connection with the Delaware Memorial Bridge at Deepwater the highway will have four lanes, divided. North of the North Camden interchange it also will have four lanes, but all structures carried overhead will be built to permit the addition of a third 12-ft. lane on each side. This arrangement will continue north to the intersection with Route 35, beyond which point there will be six 12-ft. lanes as far north as the intersection with Route 3. From Route 3 to Route 6, only four lanes will be built initially, but provision will be made for six lanes in the future. The overhead bridges from Route 35 to Route 3 will be laid out to permit converting this section at some future date into a "dual-dual highway", which is an eight-lane highway with four divided center lanes for high-speed traffic separated from the four outer lanes.

Outside shoulders are to be 16 ft. wide to the break in grade, with 10 ft. of stabilized surfacing along the pavement edge. Inner lanes will have a 5-ft. wide strip of similar stabilized material along the edge of the median zone. These zones will be 26 ft. wide south of Route 35 and 20 ft. wide north of that point.

No decision has been made yet as to the type of surfacing, whether it is to be of portland-cement concrete or bituminous concrete. Pavements are to be of heavy duty type, designed for very heavy axle loads.

Maximum grades are to be 3 percent, and a minimum radius of curva-

TRAFFIC INTERCHANGE proposed for the intersection of the new turnpike with one of the main routes to shore points. Heavy movements are anticipated only through lanes serving traffic to and from points to the north of this intersection, where the highway widens to six lanes. The toll gate is shown at the lower right.



SERVICE STATIONS and restaurants are to be set well back from the highway. Additional right-of-way 400 ft. wide is planned at such points.

ture of 3,000 ft. has been set, but most curves will have a radius of 10,000 ft. or flatter.

There are to be thirteen points of access and egress in addition to the terminals, as indicated on the accompanying map. As tolls will be collected at each of these points, certain departures from the standard type of separated interchange will be required.

The most difficult and costly construction will be in the 12-mile section north of Newark where most of the highway will be built over the tidal flats known as the "New Jersey Meadows." Very deep foundations will be required for the structures, and all fills will require preliminary stabilization of the underlying silt to eliminate settlement.

Cost and income

Engineering and construction costs on the 118-mile highway have been estimated to be $183,925,000. The turnpike authority is planning to sell $230,000,000 in bonds, which will give about $22,000,000 for contingencies.

The engineers estimate that an average of 9,910,000 vehicles will use the highway annually in each of the first five years. Tolls, plus income from concessions, are expected to yield an average annual return of $10,030,000 in the same period. It is estimated that this income, with anticipated increases in subsequent years, will be adequate to pay off the bonds in 25 years, although the turnpike authority is empowered to issue bonds with maturities up to 35 years.

When the bonds have been paid off, the turnpike is to be turned over to the New Jersey State Highway Department and operated free of tolls.

The various toll rates used in making the estimates of income have not been made public, but they are stated to be conservative, and the traffic estimates also are held to be conservative, especially as to the number of trucks using the turnpike. Toll rates for the several sections of the highway will be fixed by the turnpike authority on the basis of the cost of each section and the value of the service rendered rather than on mileage alone, due to the anticipated high cost of building the northern part of the highway.

Anticipated traffic volume

Traffic volume is expected to range from a daily average of 4,056 vehicles over the southerly end of the turnpike in 1952 to a total of 13,442 vehicles a day over the 5.1-mile section between Elizabeth and Port Street, Newark, and 13,409 vehicles on the 6.1-mile section between Raymond Boulevard (east of Newark) and New Jersey Route 3, the Lincoln Tunnel access route.

Service facilities

Special attention has been given to the design of service facilities to insure that they do not interfere with traffic on the turnpike. In general, they are to be designed along the lines developed in studies made for Route 100 in New Jersey (ENR June 23, 1949, p. 52), but on this project the turnpike authority will build all service stations and lease them instead of selling sites for service stations to oil companies, as was proposed for Route 100. The act setting up the turnpike authority requires that there be a sufficient number of gas stations to insure reasonable competition.

Restaurants are to be built by the turnpike authority in service station areas where it appears that restaurants will be needed. At such points it is proposed to acquire an additional 400-ft. width of right-of-way in order to set the restaurants well back from the highway.

Despite the fact that no bonds have been sold as yet and little right-of-way has been acquired, the turnpike authority plans to get some construction under way this year and aims to have much of the construction under contract by next spring. The 1950 working season will be devoted to major grading, drainage and foundation work. By the fall of 1950, the principal paving contracts will be let, also contracts for toll plazas and buildings in the service areas.

The 1951 working season will be devoted to paving and bridge superstructures. Thus it is hoped that the highway can be opened by November, 1951.

Engineering

Advance engineering work for part of the turnpike was done by the State Highway Department. As soon as the New Jersey Turnpike Authority had been set up with Charles M. Noble as chief engineer, a group of cooperating engineering firms known as Edwards & Kelcey, O. J. Porter & Co., Ammann and Whitney, Frederick R. Harris, Inc. Associated, and the firm of De Leuw, Cather & Co., were engaged to make the preliminary plans and estimates. Coverdale & Colpitts were engaged to make the traffic studies, and Howard, Needles, Tammen & Bergendoff were engaged as general consultants of the turnpike authority.

Within recent weeks 18 engineering firms, including those named above, were advised that all engineering work was to be done by outside firms if a decision was made to go ahead with the highway. Each firm that wished to be considered was asked to give its qualifications for the work and to state what its fee would be for the engineering on a designated section of the turnpike. Ultimately eight firms or groups of firms were selected for the seven sections into which the work has been divided.

Two of these firms are to be employed on two of the northern sections involving a large amount of work for the bridges and one firm for the highway construction. They are Ammann and Whitney; Howard, Needles, Tammen and Bergendoff for the bridges and Edwards & Kelcey, Frederick R. Harris, O. J. Porter, Associated, for the highway work. Additional firms engaged for the project are Fay, Spofford & Thorndike; DeLeuw, Cather & Co.; Parsons, Brinckerhoff, Hall & Macdonald; J. E. Greiner Co.; and Gannett, Fleming, Corddry & Carpenter.

ANTICIPATED TRAFFIC ON SECTIONS OF THE NEW JERSEY TURNPIKE

Section	Miles	Average Daily Traffic 1952	1956
Deepwater to Swedesboro	13.0	4,056	6,407
North Camden to Mt. Holly	10.2	5,868	9,268
Hightstown to New Brunswick	15.3	6,199	9,792
New Brunswick to Route 35	8.0	10,072	15,907
Route 35 to Elizabeth	8.9	12,843	20,284
Elizabeth to Port St. (Newark)	5.1	13,442	21,228
Port St. to Raymond Blvd.	2.3	11,368	17,954
Raymond Blvd. to Route 3	6.1	13,409	21,178
Route 3 to Route 6	4.1	9,460	14,940

PLEASURE BOATMEN will find complete facilities at this island for shopping, repairs, swimming, or a night's rest ashore.

Tourist Camp for Boatmen

J. H. Philpott
Consulting Engineer
Fort Lauderdale, Fla.

A SEASIDE "MOTEL" that will accommodate up to 500 pleasure boats and provide ice, valet service, laundry, repairs and even beach recreation for the craft and their owners is now nearing completion in Fort Lauderdale, Fla.

The $2,500,000 station is located between the Intracoastal Waterway and the Atlantic Ocean on property acquired by the city from the U. S. Coast Guard and named Bahia-Mar.

Facilities include:

Berths and appurtenances for about 500 craft, with water depths up to 10 ft. at mean low water. Water, telephone and electric connections are available for each craft, and all service lines are underground. In addition, a large yacht club has been built with dining rooms, bar, recreation, bath and toilet facilities. The club's kitchen will serve a maximum of 700 persons in the dining areas. Gasoline, diesel fuel and lubricants will be available on one of the piers.

Center of the development is a man-made island from which project precast concrete piers that serve as head-in berths for the water craft.

Precasting used

In order to bring the cost of the project down from an original estimate that ran between 4½ and 7 million dollars, considerable use was made of precasting techniques.

Main supports for the island bulkheads are reinforced concrete T-piles, spaced about 9 ft. on centers and set in place between steel templets by water jets. The T-piles in turn support and hold in place 6-in. thick reinforced concrete curtain slabs that are about 9 ft. square. Tops of the T-piles and the slab are at elevation plus 6, and the bottom of the slab is at about minus 3.

A cast-in-place cap maintains the alignment of the top of the wall, and special steps in the cap support the ends of the concrete walks. Tiebacks are obtained by threaded and rust-proofed steel rods (through each of the T-piles, below the cap) connected to 5-ft. dia. precast reinforced concrete discs buried inshore from the wall. Reinforced concrete posts containing the water, electric and telephone connections are provided over each T-pile—the reinforcement being continuous with that of the cap.

The arrangement of the berths resulted in an increase in the number of spaces available, and engineers estimated that the cost of this type of wall was about 40 percent less than the estimated cost of a wall providing water deep enough to dock boats parallel.

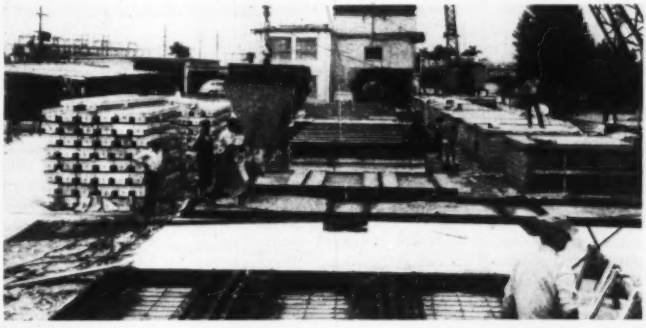
The piers and catwalks are precast reinforced concrete channel slabs, supported by precast 10-in. and 12-in. square reinforced concrete piles.

Individual piers are 10 ft. wide and the catwalks are 5 ft. Longitudinal beams of the channel slab are cut back over the piles, and the reinforcement projecting from the ends of the beams and the pile is welded together and posts are cast in place to form one continuous unit.

A set of steel lifting tongs designed by the contractor handled the channel slabs with a minimum of breakage and damage.

Some 300,000 cu. yd. of excavation from the basin were moved by 16-in. hydraulic dredge, and used to complete the island and fill low areas at the south end of the project.

General contractor for the project is the Universal Construction Co. Concrete contractors are Powell Brothers, Inc., Fort Lauderdale. Engineers are J. H. Philpott and F. V. Ackerman of Fort Lauderdale, and architects were Grunkemeyer and Sullivan and Associates, Cincinnati, Ohio.



PRECAST concrete piles (at left) and slabs for the man-made island and the piers saved about half the estimated cost of the development.

Quality Check List— Key to School Cost Control

SOMETHING CAN be done about cost control in school construction. Well planned, attractive, efficient and durable buildings can be built in any given locality in a wide range of unit costs to suit community purses.

Schools were found to cost from $6.99 to $21.79 per square foot in a survey made by ENGINEERING NEWS-RECORD ("School Construction Costs," ENR Sept. 8, p. 19). These differences are definitely not just a matter of conditions in areas or localities. In a typical locality on a site of average difficulty and accessibility, the governing board and the planner can choose to build a good school for less than $8 per square foot, or for $20, or more, as they see fit.

In most cases the total amount of money available for a school project is a fixed sum, and the problem is one of fixing a quality level that will permit the construction of the required amount of space and facilities. It is relatively rare that the governing board first fixes the level of quality and completeness desired, then the amount of space, and finally proceeds to the business of raising the required funds.

Inasmuch as the usual problem is one of adjusting the project to a fixed budget, it is important to consider what cost items most affect the total project cost. The governing board—with the advice and guidance of a competent specialist in school architecture—should make the choices and decisions that determine unit costs with all the cards on the table, to save where saving is advisable, to put quality where quality is the most economical in the long run.

Costs Analyzed

Drawing from a wide experience as specialists in school planning and school architecture, the firm of Ernest J. Kump and Mark Falk, San Francisco school architects, has recently released the results of an analysis by Alfred Christensen, their chief planning consultant, of factors that enter into cost control. Here they are:

(a) Quality levels in both buildings and equipment.—Although a consistent standard of quality in any building is a virtual necessity, exceptions should be made where items affect costs out of proportion to their utility. Fancy hardwoods, tiles, acoustical boards, hardware, plumbing fixtures or light fixtures, when used consistently in the highest grades, boost unit costs far more than the difference between best and average structural items. The alternatives of quality level and their effect on first-costs in a number of major instances, are noted in Table A on the facing page.

(b) Completeness in equipment and facilities.—Basic to unit cost determination are questions of completeness of classrooms, playrooms, all special facilities, toilets and playground. Completeness means adequacy of equipment in relation to the number of students—dispersion of such items as cabinets, blackboards, lights and toilets. Some of the choices as to completeness both in and out of the building are outlined for study in Table B.

(c) Extent of site development work.—The costs of playgrounds, driveways, walks, patios and landscaping are determined largely by two factors—climatic conditions regulating outdoor living and the physical nature of the site. Unit costs of site improvement will represent an adjustment of local needs according to site complications, as in the instances cited in Table C.

(d) Extent and complexity of utilities and services.—This is another factor that is heavily related to site selection, and also to building codes. The time for the board to make cost-fixing decisions on these questions is during the process of site location. Once the school is located, the minimum cost of utilities is fairly well established, any likely economies from then on can be realized only by installation of simple utility systems rather than elaborate ones. Situations of high, low and medium first-costs in sewerage, electric, water and gas or other utility supply are presented in Table D.

(e) Quantity and difficulty of foundations.—Foundation costs depend largely on site and design considerations that are basically structural, making control by the planners very difficult. In some instances however, the planners may recognize that it will be less costly in the long run to pay high foundation costs in a central location than it would be to pay transportation costs for a majority of the students to an outlying area of such a site were selected.

Good drawings a must

(f) Skill, care and completeness in preparation of drawings and specifications.—The exactness with which construction expenses can be controlled is determined mainly by the accuracy of the preliminaries. Without complete understanding of just what in the school is costing the money, planners cannot safely assume that their tailor-made schoolhouse will have tailor-made unit costs.

If the plans and specifications are skillfully, completely and accurately prepared the school district can expect more favorable bids and consequently lower unit costs than will result from preliminaries, lacking in clarity and detail. In the latter case the bidder must insert a generous allowance for contingencies in his bid. The best and most skillful architect is the cheapest in the long run.

(g) Design premises.—Severe restrictions on cost control are sometimes imposed by the environment or by

the tastes, likes, dislikes, preferences and prejudices of the governing board or the architect. Sometimes an existing building must be matched in every detail, and costs are thereby fixed. In some cases there is resistance to new concepts of design that might present substantial savings. Educational structures are too often limited by traditionalism and the requirement that they be monumental rather than functional.

TABLE A. QUALITY LEVELS

Item	Lowest First Cost	Medium First Cost	Highest First Cost
Roofing	Roll roofing Asphalt shingles	Split shakes Asbestos shingles	Tile, Slate
Ceiling	Fiberboard tile	Plaster	Fireproof acoustical tile
Floor covering	Bare concrete	Lower grades of linoleum or asphalt tile	Hardwoods Best grades of linoleum or tile
Floor structure	Slab on fill	Supported wood floor	Supported floor on steel girders
Exterior walls	Single siding on studs	Stucco on sheathing	Face brick, reinforced brick, adobe, stone
Insulation	None	Minimum in roof only	Heavy insulation in roof, walls & partitions
Hardware	Plated steel	Medium grade	Solid bronze or brass
Plumbing fixtures	Low grades Floor-mounted toilets and wash sinks, wall-hung urinals, cold water only	Medium grades Hot water in all lavatories	High grades Wall-hung toilets, full-height urinals Washfountains, hot water throughout
Toilet room finish	Painted plywood, cement floor, wood partitions	Cement-plaster walls, steel partitions	Tile finish, terrazzo or tile floor, marble partitions
Chalkboards & tackboards	Low-grade boards applied directly on walls, wood trim	Medium grade with flexible mounting	Top grade or slate, aluminum hardware, plywood backing
Painting	Exterior unpainted or one-coat stain. Two-coat job, cheap paints specified	Three-coat job Average paints specified	Wax over finish inside. Three or more coats; best paints specified
Cabinetwork	Mill-made soft woods, linoleum tops, one-coat stain finish, min. hgt. & depth	Hardwood tops Standardized units Adequate size	All hardwood Tile counters Stainless steel sinks, acid proof. All specialized
Light Fixtures	Cheap grades Sparsely spaced	Average grades Adequately spaced	High quality Spaced for high levels of illumination
Glass	Single strength B grade common	Double strength A or B grade	Plate, structural or safety glass
Paving	Water-bound rock or natural surface	Oiled surface on minimum subgrade	Heavy rock subgrade Asphalt surface
Sash	Wood sash, minimum number operable Maximum use of fixed glass in stops	Wood or steel sash nearly all operable	Steel or aluminum sash, all operable
Heating	Gas space heaters in each room	Radiant panel heating; central air heating	Steam radiators Refrigerant cooling
Ventilation	Natural with few operable sash, no fans	Natural, adequate openings and vents. Fans in some rooms like toilets	Artificial, with sealed building and all spaces automatically ventilated
Corridors	Side corridors open. Connecting walks only. Ceilings unfinished	No heat in corridors. Covered connecting corridors, plastered ceilings	Glassed-in corridors, heated. Acoustic ceiling

TABLE B. COMPLETENESS

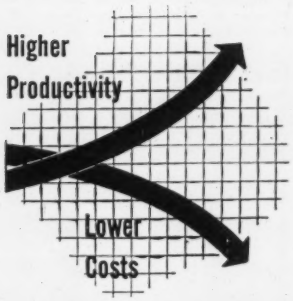
Item	Lowest First Cost	Medium First Cost	Highest First Cost
Classroom cabinets	Bare minimum Sinks only in a few special rooms	Reasonably complete. Standardized designs. One sink in most rooms	Complete for every educational purpose. Tailored designs Two sinks per room
Chalkboards & tackboards	Bare minimum in number and size	Adequate in number and size	Every available wall space covered. Extra hgt. and width
Sanitary facilities	Barely meeting code requirements Concentrated in few rooms	Adequate in number, well dispersed	Meeting highest requirements, wide dispersal, short walking distances
Light Fixtures	Minimum for janitorial use installed	Install part of wattage as low-level daylight supplement only	Complete installation of full wattage for high-level night lighting
Auxiliary facilities	Nothing but simple classrooms and toilets	Partial provision for storage, janitorial, administration, assembly, teachers, cafeteria	Full provision for all auxiliary storage, administrative and faculty facilities
Special equipment	No provision for PA, intercom. and visual aids. Few elect. outlets	Conduits only for future installation of PA, intercom. etc., one or two outlets per room	PA and intercom. installed. All rooms darkened for visual aids. Four or more outlets per room
Playground development	No development	Leveling only	Backstops, grading, surfacing, equipment

TABLE C. SITE DEVELOPMENT

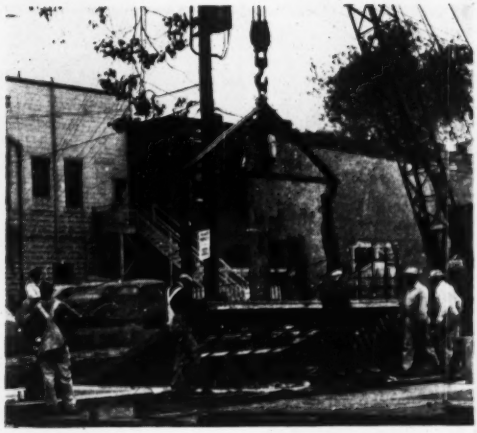
Item	Lowest First Cost	Medium First Cost	Highest First Cost
Grading & excavation	Minimum needed, short hauls	Moderate earth moving, all mat'l on site. Digging fairly easy, no old foundations	Hard cutting in rock Steep site, imported fill, old work to remove
Paving	None in contract	Small areas adjacent to building	Extensive areas of the site paved, curbs, gutters
Condition of site	Level, dry, clear accessible, good streets	Average condition	Trees, building, foundation to remove, lines to move, poor accessibility
Fencing	None in contract	Good quality in moderate amount. Straight runs	Extensive and difficult fencing. High quality specified
Drainage	No problem	Curbs and gutters adequate. Surface treatment will suffice	Subsurface drainage system, tiles, dry wells, gratings, catch basins, conduits

TABLE D. UTILITIES AND SERVICES

Item	Lowest First Cost	Medium First Cost	Highest First Cost
Sewage disposal	Short run to adequate lines, easy soil conditions	Average or long run to mains, hard digging	Complete and costly disposal system with such items as ejection pumps, leaching beds
Electric service	Pole transformers by utility and short overhead run	Pole transformers, underground service	Transformer vault and transformers by owner. All underground
Water supply	Adequate supply close to buildings	Moderate runs to adequate main. Connection aver.	Long or difficult runs to main. Own well and pressure system or elevated tank
Gas supply	Simple, short and easy connection. No standby needed	Moderately difficult connection. Propane standby	Long runs under difficult conditions. Oil standby



Precasting Cuts Shop Building Costs



1 TILT-UP for a wall section begins. Steel lifting jig has offset hinged members which let wall hang upright.

SITE-PRECASTING saved a third on the inclosure cost of a concrete industrial building in South Pasadena, Calif., for the Helipot Corporation, manufacturer of electronic devices.

The new building provides 10,000 sq. ft. of area on one floor. Walls, frame and roof all are precast reinforced concrete.

Concrete floors laid on the ground served as casting platforms for all inclosure elements. This feature, together with lifting arrangements designed by the contractor, enabled the crane-hoisting of cured elements directly from the forms to place.

Savings resulting from these methods included a reduction in wall cost from $1.35 per sq. ft. (estimate for poured in place construction) to $0.70 per sq. ft. Lessons of this job may reduce the wall cost still further, to $0.50 per sq. ft. Savings in frame and roof costs are less spectacular, but they contribute to an over-all saving of one-third the estimate for poured in place work.

Preparations for casting

Placing foundations and floors was the first step in construction. Column footings were placed in excavations without forms, about 5x5 ft. in plan, with plates to match plates at column bases. Wall footings, also placed without forms, were grooved to receive walls. A 4-in. reinforced concrete floor slab was placed checkerboard-fashion and steel-troweled over the building's 75x135-ft. area.

The smooth finish obtained with steel trowels served as a casting platform for walls, rigid-frame bents and roof elements. A layer of wax on the casting platform enabled the contractor to pour his elements in bottomless forms erected directly on the platform.

Wall forms consisted of headers for panels 6 in. thick and up to 20x20-ft. size. Inside these headers, ½-in. bars were placed at 12 in. both ways. Steel frames for openings also were installed, as were electrical boxes and conduits. Quick-connect fittings were set at side headers to provide conduit continuity. Then concrete was placed (from transit-mixed trucks), screeded and troweled.

Rigid-frame bents were cast on their sides, one at a time, in piles of four similar bents. Forms were stripped from one level and set at the next, yielding an increasing efficiency in carpenter and concrete-crew work as the bent precasting approached workbench height. Column base plates matched those on footings.

Roof elements, flat slabs and ribbed slabs, were cast upside down to make maximum use of the casting platform's smooth face. A roof form arrangement is shown in the fourth illustration. Slabs were formed 4 in. thick and 22 ft. long, the spacing between frame bents. Beams (the ribs) were formed in the long dimension of ribbed slabs, to carry the roof loads to seats in frames. Seats also were formed at the upper edges of exterior ribs, to receive adjacent plain slabs and transfer their loads to the beams.

Erection procedures

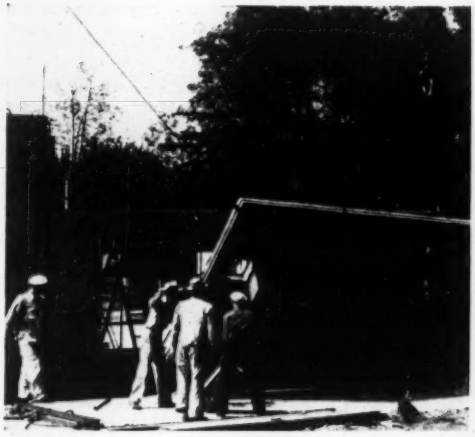
Equipment for lifting precast elements consisted of a 20-ton truck crane and lifting jigs and slings, arranged to apply minimum lifting stress with maximum position-control to the building elements during tilt-up or hoisting. Eyes or anchor-nuts formed in the building elements provided for sling attachment.

Wall sections, which had been formed adjacent to their final positions, were tilted-up to place with the aid of the jig shown in the first illustration. The foundation groove was filled with thick grout to obtain a tight joint. Gaps remained between panels, for tie-in to columns of the rigid frame bents. Bent erection proceeded with wall erection, the bent sling being a simple two-part wire rope sling attached by clevises to eyes on the beams. (A more complicated sling was unnecessary because structural design stresses in the bents were greater than simple-sling stresses).

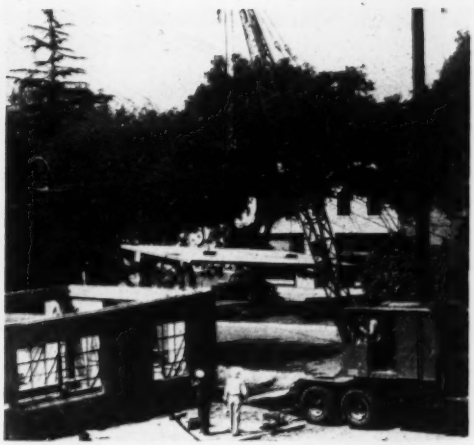
Special shores for adjustment

Both walls and bents were plumbed with adjustable pipe-and-threaded-rod turnbuckle shores that would move the elements ¼ in. with a quarter turn (see fourth photo).

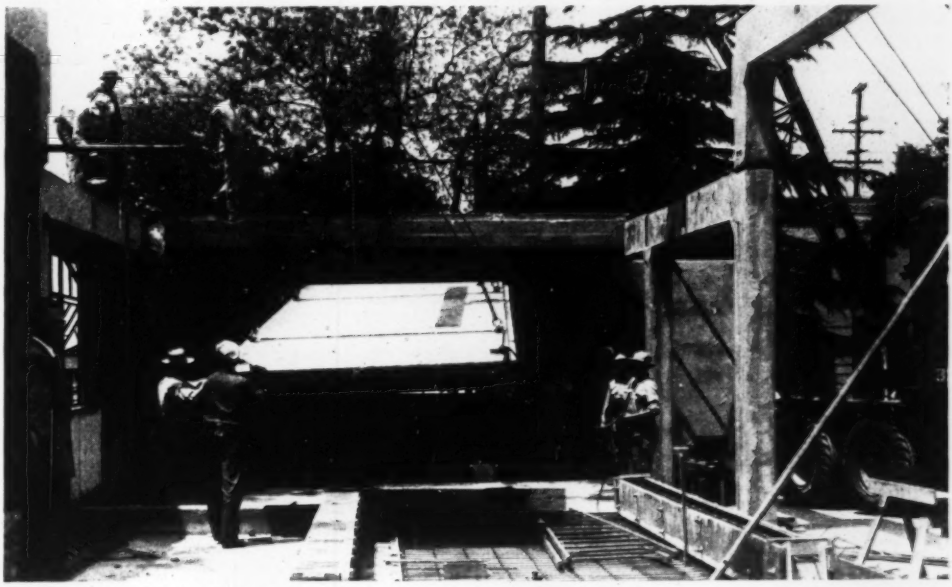
Getting roof elements upside-up and to place was a little more complicated. First a slab was tilted by vertical pulls through a strongback and single lines attached to angle-iron eyes on the top. The slab was hoisted to vertical position, then lowered to upside-up position on the casting platform (second photo). Then two-part slings with spreaders, hanging from the ends of the strongback, were attached to eyes screwed into anchored nuts in the slab, for final hoisting. In the fourth photo, note the man on frame at the upper left pouring thick grout into a beam seat.



2 ROOF SECTION INVERSION, almost complete. Crews could turn a roof slab upside-up in five minutes.



3 HOISTING THE ROOF section to place. Special spreader slings on strong-back induced minimum stresses.



4 RIBBED SLAB, here rising to take place in roof, had been cast upside down on concrete floor. Note forms and steel for another ribbed slab, lower right. Also shores for plumbing walls, frames.

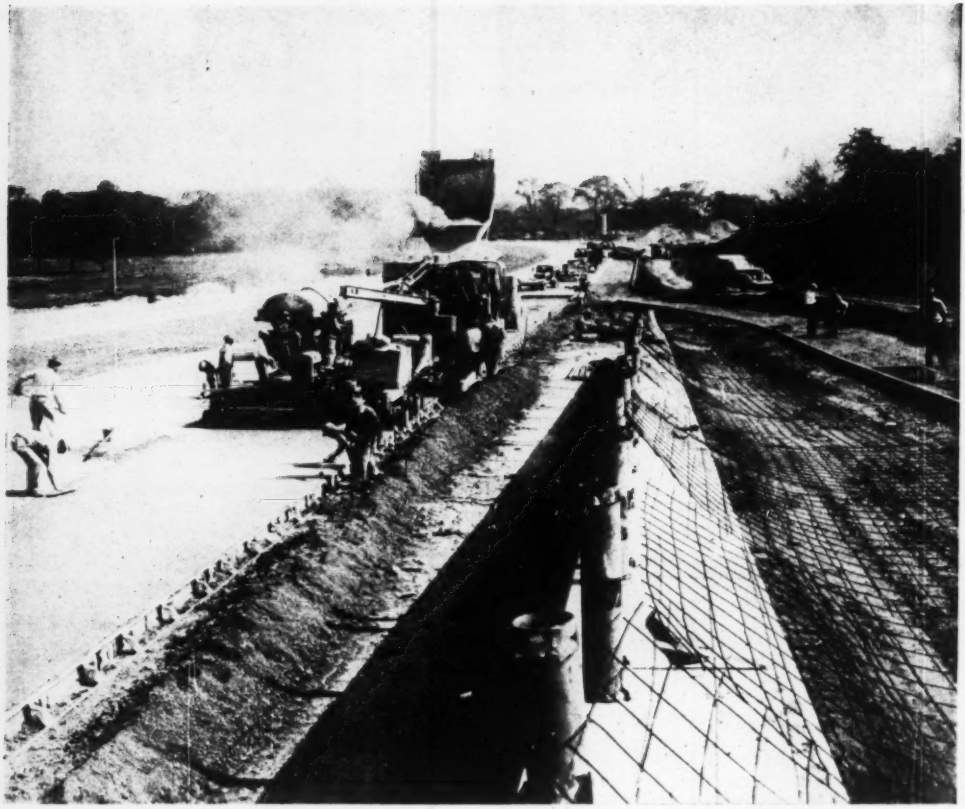
When walls, frames and roof were in place, joint steel was tied, lapped or welded, and all joints were gunited.

Truck crane important

The important piece of equipment on this job was the heavy-duty motor crane. Its movability enabled the contractor to schedule a quick succession of erection phases once he had a number of building elements cast. He could bring the crane on the job the day erection was scheduled, make full-time use of it and pull it off until the next erection day. Because the crane was a rented unit, this was an important cost-saving factor.

The contractor was William J. Moran, Alhambra, Calif. F. Thomas Collins and E. M. Bennetsen, consulting engineer and chief engineer for Moran, designed the job. W. C. Croft is general manager of the Moran company.

The Moran company is one of several Southern California firms that perform site-precasting. More than a hundred precast buildings have been built in that area since World War II. At present builders are pushing building code revisions, so that more refinements can be engineered into precast construction.



Placing 1,840 ft. of pavement per day on Lakeland Freeway illustrates how . . .

Fast Construction Saves Money

FIVE BIG HIGHWAY and bridge construction jobs totaling $6,300,000, plus $1,450,000 worth of street resurfacing under 18 projects—all handled by one company during the two construction seasons of 1948 and 1949—is big-time contracting.

And when two of the contracts are completed one year ahead of schedule, it shows that good programming and vigorous expediting of the work pays off in three ways—convenience to the public in securing the facilities ahead of schedule, less field costs for the state highway department, and less job costs to the contractor.

Such is the record of the Horvitz Co., Cleveland, Ohio, who capitalized on the diversity of work involved to increase production and reduce job costs of both equipment and labor. The jobs are located in or near Cleveland.

The four largest contracts are:

A $3,000,000 job for 1.7 mi. of the Willow Freeway in southeastern Cleveland; involving a million yards of grading; four large bridges and a four-lane divided concrete pavement (ENR Jan. 20, p. 64); and a great deal of retaining wall work;

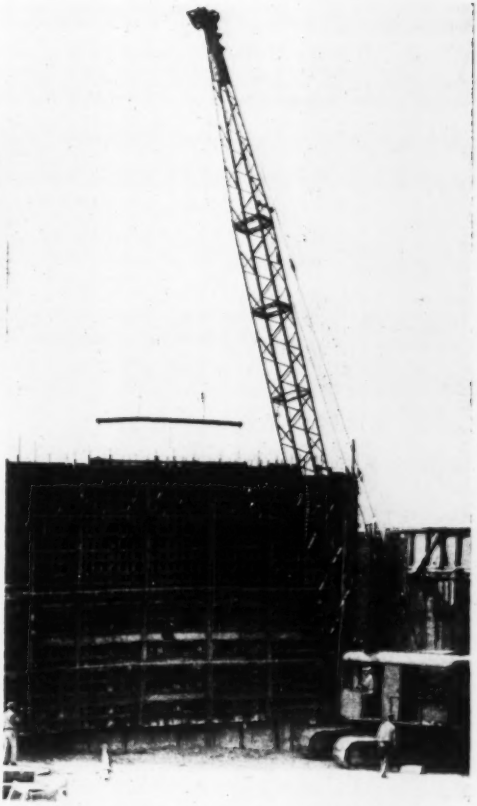
A 3¼ mi. paving project on the Lakeland Freeway in the northeastern part of the city, involving placing of four 12-ft. lanes of concrete paving to complete a six-lane divided highway and widening a two-lane bridge to carry six traffic lanes;

Construction of the Eddy Road Interchange on the Lakeland Freeway—a complicated affair that includes a 390-ft., four-lane bridge over the freeway and adjacent railroad tracks and 2¼ mi. of concrete-paved approach ramps; all under a $1,450,000 contract.

A $700,000 contract for a six-lane extension of Chester Ave., from East 55th to East 93rd streets (involving removal of all structures on the right of way through a residential district) which will see a new road of two 35-ft. lanes, plus an 18-ft. median strip. The pavement will be 6 in. of granulated slag, 4 in. of dry-bound

LEFT-TURNERS on the new Chester Ave. extension must do so from a channeled slot flanked by stone curbs. This 38-block expressway will be completed a year ahead of time.

BULLDOZER AND PATROL GRADER clean up around a pedestrian overhead bridge spanning the Willow Freeway, preparatory to landscaping embankment slopes.



RE-USABLE PANEL FORMS, 32 x 44 ft. and weighing 12 tons each, speeded completion of the $1,450,000 Eddy Road interchange. Forms were handled by a crane with an 80-ft. boom.

macadam, and 4 in. of asphaltic concrete placed in a 3 in. leveling course and a 1 in. surface course.

In addition, the company completed 18 other contracts during 1948 and 1949, involving asphalt streets and highway resurfacing.

How construction work of this scope and diversity was carried on, more or less simultaneously, requires a several-part answer, which includes top-flight supervision and securing a full day's work from the workmen—all geared to greater productivity and decreased job costs.

Organization of the individual contracts and their overall correlation—especially from the standpoint of the most efficient utilization of high-priced and special equipment—play significant roles in the total picture.

One general superintendent has the responsibility of integrating and expediting all contracts. Each is pushed rapidly to completion regardless of size or type. There is one chief engineer and two assistants, each a recognized authority in the construction industry.

Next in line are the job superintendents, most of whom have been with Horvitz for 20 years or more. A typical payroll, during a peak-week last summer totaled 363. This force was made up of 7 superintendents, 27 foremen, 11 field office men, 168 skilled and semi-skilled laborers, and 150 common laborers.

Trained crews for each operation

Another policy of top-management, resulting in greater productivity and lowered job costs, is that of having especially trained crews for the various special jobs.

For example, one concrete paving crew lays all concrete pavement including bridge approaches and ramps on the different jobs, as well as thousands of feet of concrete sidewalks. Curb-setting—involving the placement this year of 30 mi. of 6x20-in. cut-stone—was done by a crew trained for that particular work. Other trained crews raise and re-set manhole structures on street resurfacing and new surfacing; construct sewers; do heavy grading; and bridge construction. This insures full employment throughout the construction season.

Some yardstick of the efficiency of these specialized and trained crews can be visualized in "best day's work" on the various jobs.

The concrete paving gang placed 1,840 ft. of 12-ft. reinforced pavement, 10-in. thick, in an 8-hr. day on the Lakeland Freeway. Moreover, it averaged 455 cu. yd. of concrete pave-

ment per 8-hr. day for 48 consecutive calendar days exclusive of Sundays.

On the Chester Ave. job, the asphalt gang laid 1,000 tons of bituminous asphalt in 10 hr., in the 3-in. leveling course and, later, they laid down 900 tons of asphalt surfacing course, in 10 hr.

Best day's work in earthmoving, on the Willow Freeway, was 15,000 cu.yd. in 8 hr., by four 12-cu.yd., three 15-cu.yd., and two 24-cu.yd. earth carrying scrapers. Average length of haul was 1,500 ft. Concrete paving on this contract averaged nearly 500 cu.yd. of concrete for 22 consecutive days, Sundays excluded.

One form for 56 pours

Large, re-usable panel forms for concrete ramp walls was one of the secrets of the Eddy Road Interchange being completed one year ahead of schedule. One set of forms, forming part of a 32-ft. high by 44-ft. long panel, was re-used 56 times in pouring the 2,600 ft. of cellular-ramp walls.

The only operations subcontracted by Horvitz are structural steel erection, and landscaping—neither of which is large enough in volume to give full-time work for a crew. All heavy equipment is moved from job to job by a commercial trucking company.

Productivity of the workman, both skilled and unskilled, is maintained at an above-average rate, by three expedients: Close contact with supervision and a sense of loyalty to the company; generous overtime which not only expedites the work but insures a substantial paycheck; and a sense of security on the part of the workman because of the large amount of work undertaken.

Some reduction of the labor force is, of course, necessary during the winter season. This is done early in December; then all activities are shut down two weeks during the holiday season.

Year-around equipment maintenance

Equipment maintenance—a large item of overhead—receives careful attention the year-around. All rolling equipment gets a thorough overhauling during the slack winter season, in the company's large garage and repair shop. Quick, on-the-spot repairs are made during construction either by a full-time master mechanic assigned to each project or by a crew from the garage.

Three company cars—assigned to the asphalt resurfacing superintendent, the superintendent of equipment and a master mechanic in charge of all truck maintenance—are equipped with radio-telephone to keep in constant contact with field offices, repair shop, and asphalt plant.

Routine servicing of the heavy earthmoving equipment, concrete paver, asphalt spreader, etc., is done by the operators, using portable grease guns. Each operator is given overtime for this work. This procedure has proved highly successful, especially as it places the responsibility on each operator for keeping his equipment in top running condition.

Advance planning by top management pays dividends in expediting the work. Basically, the company bids in only enough work to keep its crews and equipment operating at top efficiency. New equipment is added, from time to time, but only if the work in sight justifies the added investment.

Two jobs combined for profit

One example of foresightedness was demonstrated in planning for the Chester Ave. extension and the Lakeland Freeway jobs, located about 3 mi. apart. Design plans showed 100,000 cu.yd. of excavation to be wasted from the former project and a similar amount of borrow needed on the latter. In each instance, an average 8-mi. haul was needed to waste the material or to secure borrow.

By bidding the Chester Ave. job "tight", Horvitz secured the contract. Then when the Lakeland Freeway job was advertised for letting the company offered a bid for the work considerably lower than that of any competitor. By using the 100,000 cu.yd. of excavation from the Chester Ave. job as borrow on the Lakeland Freeway job, considerable money was saved for both the state and the contractor.

Equipment versus labor

In summing up his company's philosophy of contracting at a profit, I. Horvitz, vice-president, emphasized the optimum mechanization of the work as a balance against high wages paid for both common labor ($1.72 to $2.00) and skilled labor ($2.27 to $2.52). An estimated one-half of his equipment is less than two years old, while good preventive maintenance pays dividends in the efficient operation of older equipment.

In setting up a new job it is assigned adequate equipment, with the size of crew balanced against the equipment, to give a high initial production capacity. This production rate is increased as the job progresses by borrowing idle equipment from other projects, with crews working overtime as necessary to keep abreast of stiff production schedules. Overtime costs often are offset by greater continuity of operation of expensive construction machinery.

Key supervising personnel

S. A. Horvitz is president of the company, which has been in the grading, paving and bridge construction business since 1916. E. C. Blosser is chief engineer, assisted by T. W. Kinnear and W. W. Fleming—all three formerly construction engineers with the Ohio Highway Dept.

Alvin Kohn is general superintendent; Ferral Shons, superintendent on all bridges; and Billy Smith, in charge of the company's asphalt plant and all street resurfacing. George Swailes is superintendent of equipment.

Construction superintendents on grading and pacing include: Carl Heinzerling (Willow Freeway), Ken Bills (Lakeland Freeway), Earl Chambers (Chester Ave. extension) and Mike Sekela (Chagrin Valley Road).

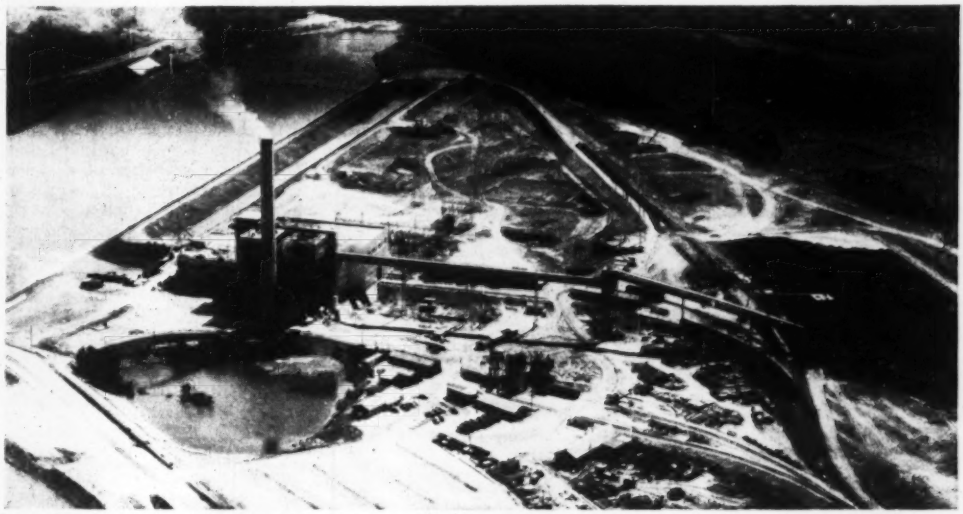
Subsurface Parking Found Proper Street Use

The use of the subsurface of a city street for automobile parking is a proper highway use, and abutting owners are entitled to no compensation, the Michigan supreme court said recently.

The state court, in an action involving the city of Detroit, said that the abutting property owners are not entitled to compensation so long as access to and use of their property is not interfered with.

The action arose in 1945, when the city proposed to build a parking garage under Washington Boulevard, to be financed by revenue bonds secured by the revenue derived from the project. Voters approved the plan; a municipal parking authority was created by ordinance. Abutting property owners asked a lower court to prevent the city from "erecting, constructing, leasing and operating" the garage. The lower court supported the property owner on the ground that he held title to the center of the boulevard, subject, only to the easement of the public for its use as a public highway. The lower court judge said that erection and operation of a parking garage therefore was unlawful and an invasion of the owner's rights.

The supreme court, however, held that ancient laws concerning access to public highways for the convenience of the general public could not be applied. With the growth of cities has come greater needs for certain facilities and a corresponding extension of public rights in the streets.



CAPITAL COSTS WERE REDUCED by semi-outdoor construction at the Hutchins Station, Dayton, Ohio.

Reducing Costs on Power Plants

THE COST OF BUILDING the steam power stations that the electric power industry had to erect, to meet the spectacular increase in power demand that followed the war, did not rise nearly as fast as did many other costs. Why this happened was the subject of an illuminating paper by Philip Sporn, president of the American Gas & Electric Service Corp., at the recent convention of the Edison Electric Institute.

Taking the cost index for 1940 as a base of 100, said Mr. Sporn, the index for 1948 stood at approximately 175. On this basis, therefore, the cost of a kilowatt of steam electric generating capacity which was running between $80 and $100 in 1940, should have climbed to $140 to $175 by 1948. But as a matter of fact, millions of kilowatts of capacity were put in at lower costs. In the group of companies studied by Mr. Sporn, one company had succeeded in bringing the cost down to between $100 and $115 per kilowatt.

In the preparation of his paper, Mr. Sporn went over records supplied to him by eleven major groups of electric power companies in addition to those in his own group. From those records he compiled a large table of significant methods for reducing the cost of building and operating electric generating stations. Those items that related to the civil engineering aspects of power-plant construction are given in the accompanying table.

Among the important factors that have produced reductions in the cost of structures at steam power generating stations, Mr. Sporn cited the following:

A heavy reduction has been made in building space per unit of capacity as compared to the early 30's; reductions of 50 percent, that is, down to one-half of what was previously thought necessary in cubage per unit of capacity, having been found possible. This obviously carries with it not only a saving in building, but the concomitant saving in piping and in cabling.

Reduction of housing and structure cost by placing more equipment, including some rotating equipment outdoors. This has offered savings in costs up to $2 per kilowatt.

Restudy of foundation techniques has made possible reductions in costs up to $1 per kilowatt.

Control of concrete mixes has saved up to $0.25 per kilowatt.

More careful steel design and full utilization of maximum permitted unit stresses has resulted in savings up to $1 per kilowatt.

Closer coordination of material delivery and reduction of time necessary to complete a job has resulted in savings up to $2 per kilowatt.

Mr. Sporn said that not all the groups reporting to him have used all the ideas set forth in his tabulation, but added that one group estimated its savings on these apparently small items at $5.40 per kilowatt.

"I hope that no one will take this as a complete report of all the routes that can be followed to achieve the specified ends; at the most it should be taken as an extensive record of achievement against which to check one's own performance. But it will serve its purpose best if it is used as a stimulant and challenge for further development of ideas and methods, perhaps having less general applicability, but being in each case more directly suited to the local situation.

"Perhaps in every case where results along the economy route are sought, this summary should be given to the technicians and operators for study. If that course is followed, however, care must be taken that such fruit as might be gathered by this process is

not entirely ruined in the budding stage by the freezing atmosphere brought on by the attitude: 'Oh, this may be all right in Kokomo or Kankakee, but we do it differently on our system.'

"The ability to find solutions to new, and new solutions to old problems by bringing to bear on them engineering developments and principles and by the general application of scientific methods has behind it a long tradition in the electric power industry. In this postwar expansion period, capital and operating cost reductions of major proportions have been developed, and more can and will have to be developed, and I believe will be developed."

"All that I have just recounted is a stimulating example of what has been and is being achieved. On the other hand, some useful tools and techniques have hardly been mentioned. Among these is the possibility of reducing capital costs of generating capacity by staggering of construction between neighboring interconnected systems, the potentialities of large savings in more detailed attention to the techniques of contracting and in exercising closer control to assure economical use of expensive construction labor. Even if these represent failures to take full advantage of all latent possibilities, there is no warrant for discouragement. The record of accomplishment is splendid. It can be made even better in the future."

TECHNIQUES ADOPTED TO CONTROL COSTS IN THE CONSTRUCTION OF POWER GENERATING STATIONS

(Factors of special importance to civil engineers taken from a much larger table prepared by Philip Sporn, covering all engineering work in the design, construction and operation of steam stations.)

Techniques	Remarks
Installation of larger generating units.	All unit costs decreased, dollars/kw, men/kw, building area and volume. Costs as low as $115/kw are reported.
Simplification of design	
(a) Unit installation of single boiler-turbine.	
(b) Standardized design and duplication of equipment.	Decreases drafting and engineering time and costs.
(c) Large single shaft units	Eliminates crossover piping.
(d) Simplified layouts and elimination of little used equipment such as cranes, wheels, rails.	One company claims plants have always been of utilitarian design and little can be done to reduce capital costs.
Improved Plant Construction Techniques	
(a) With better knowledge of soil mechanics, foundations are no longer sunk to bed rock.	Estimated savings up to 1.00/kw of installed capacity.
(b) Careful control of concrete mix and better placement methods.	Saves about one sack of cement per yard of concrete.
(c) Better knowledge of concrete and steel and increased stressing of these materials.	Estimated savings up to 1.00/kw of installed capacity.
(d) Use of formed metal decking with light concrete fill for floors instead of concrete floor slabs poured on wood forms.	Savings of about $.75/sq ft of floor area.
(e) Elimination of conduits and the use of sheet metal troughs for groups of control and auxiliary power cable.	Saves about $.55/kw of installed capacity.
(f) Putting more equipment outdoors including rotating equipment.	
(g) Placing draft fans, precipitators, air heaters and stacks at grade.	Reduces structural steel requirements.
(h) Using aluminum siding to decrease building costs.	
(i) Using aluminum instead of copper buses.	
The effect of new tools and techniques on reducing transmission line construction costs is widely noted. Following is a typical list;	
(a) Aerial surveys and mapping.	Reduced land acquisition costs and improved accuracy of projections is reported.
(b) Walkie-talkies, rented radio telephones on line construction trucks.	
(c) Close scheduling of the various construction operations to prevent overlapping.	
(d) Gas engine pumps and adjustable steel forms for concreting tower footings, trench diggers, mobile cranes, pole hole diggers, chain saws, bulldozers, chemical sprays.	
A new approach to contract bids is indicated, one company requiring bids to be submitted on a unit price basis, the company acting as general contractor thereafter and supervising contractors' work in detail.	Because lump-sum bids generally include sizeable contingency cost factors, substantial savings from this procedure are reported.
Extensive use of contract labor during peak construction periods and for special jobs.	Reduces the number of personnel carried on the permanent pay roll.
Setting up of expediting groups to keep close check on materials delivery.	Of particular importance during the past few years. In addition to estimated savings of $2 per kw reported in one instance, greatly needed capacity has been brought on the line sooner.

Consider the Contractor in Drawing Plans

Art B. Smith
Swinerton & Walberg Co.,
General Contractors
San Francisco, Calif.

JOB COSTS CAN BE REDUCED if engineers and architects will give thorough consideration to two things:

(1) Is the job easy to estimate?

(2) Are the job details complete and well thought out?

Consider first how a contractor makes his estimate. One of the primary duties of the estimator is to make a quantity survey, but many plans are so drawn that this is difficult to do. Even though all the necessary dimensions may be available, some of them may be buried on sheet 25 when needed on sheet 3.

For example, if complete and accurate dimensions are not shown on footing drawings, the quantity surveyor will quickly make a liberal estimate of the amount of concrete involved. This estimate, in nine cases out of ten, is excessive. In fact, even with nearly complete information, qualified quantity surveyors add a contingency factor of 5 percent or more to the quantities.

In this regard, the suggestion by R. D. Sannit of Buffalo, N. Y., that each set of plans include a guaranteed quantity survey (ENR Dec. 9, 1948, p. 107) is well worth considering. Mr. Sannit said that for each job there is only one correct quantity survey and that is the exact amount of materials that will be incorporated in the building when it is completed.

A guaranteed quantity survey would undoubtedly make a job easier to estimate and, thus, reduce costs. However, until such a system is universally adopted, it is important that complete and adequate details be listed.

All engineers would benefit by serving time as quantity surveyors in the office of a general contractor. They would then know what contractors look for on the drawings, thus make the completed project less expensive.

Cubic yardage of concrete can be obtained relatively easily and with some degree of accuracy. But formwork to place this concrete is as much as 75 percent of the concrete cost and only experienced layout men can compute this cost accurately. Drawings should indicate what is desired in formwork. Time lapse for stripping cantilevers and such sections to allow reuse of forms should be shown.

Another factor involved in making a job easy to estimate is the time available. In many cases, the owner is anxious to get the job started and the engineer would like to know the full amount of his fee once he has the drawing completed. So, bid forms are prepared and with a shrug of the shoulders the decision is made to "have the bids in 10 days." Included in this time may be two week-ends and possibly a holiday.

Yet, with only one set of plans and specifications, the builder is expected to prepare a list of quantities, survey the entire project, interview the subcontractors, visit the site, analyze the specifications and then guess the rest of this job.

Duplicate sets of drawings and specifications are necessary. On most building jobs the subcontractor's work ranges from 30 to 70 percent of the total. By having ample sets of plans available, subcontractors can prepare a more thoroughly considered bid.

Designers should become acquainted with the segregation of subcontract items. For example all iron or steel in a job is not handled by a structural steel fabricator. Subcontractors are reluctant to bid on items under specification headings in which they have no interest. They also hesitate to pore over plans and specifications to select items of interest.

How about the job details?

To answer the second question in the introductory paragraph, a designer must also place himself in the contractor's shoes. Engineers aren't expected to completely build the job and thus leave little room for a contractor's initiative. But they can make things easier for the contractors—and thus less expensive to owners.

For example, on unusual details, the plans could include a suggested scheme for concrete forms. Formwork is the most expensive part of any structure. Plans should be definite in their detail and broad in interpretation of the detail. Thorough use should be made of standards set up by manufacturers and industry-wide organizations. The information should be so clear that the contractor's interpretation is positive.

On some structures, the entire area between window head and window sill is considered a spandrel beam. Yet no indication is made as to whether this beam can be poured up to the floor line with a cold joint or must be poured to the sill line. Added expense is involved in extending pour lines above or below a framed deck. Thus, the detail should indicate location of the cold joint so the builder can determine an accurate cost in advance.

The plans can assist the contractor in laying out a pour program for concrete. Pours may vary from 50 to 400 cu. yd. a day. They should be so arranged that no restrictions are put on the constructor to force him to pay a crew stand-by time where, because of union regulations, they are unable to produce in other fields.

Time is important

In building jobs, time is important. Yet materials are specified for a 90-day job that require 90 days to obtain. Such hard-to-get mechanical equipment should be ordered ahead of time.

On a recent job done by the author's firm, a change was made at the last minute in the mechanical work. The building had to be started before the equipment could be procured and it was later discovered that one of the major items could not be brought through the normal building openings in its assembled state. It was ordered from an Eastern firm for delivery in the West. Yet the manufacturer balked at letting the contractor's men assemble the equipment. The only solution available was to ship the equipment in knocked down condition, together with a technician to assemble it.

In the instance just cited perhaps the owner rather than the engineer was at fault for changes at the last minute. However, that is the sort of thing that the engineer should thoroughly consider in drawing his plans.

Money is sometimes saved by conferences with the prospective contractor before the drawings are completed. One recent project involved a boiler system located in the basement estimated at $85,000. At a conference, the contractor pointed out that a considerable saving could be made by placing this installation on the roof.

Many other instances can be cited where a little extra thought on the part of the designer would save money.

Engineer, Architect Save Money as a Team

Nicholas Farkas

Farkas & Barron,
Consulting Engineers
New York, N. Y.

WORKING CLOSELY TOGETHER, and with a thorough understanding of each other's functions, the engineer and the architect together can make deep cuts in construction costs.

Rather than presenting the engineer with a completed set of plans that will limit his construction work and know-how, the architect should work with the engineer on these plans so that such details as architectural decoration, economical wall sections, room layouts adaptable to simple framing, can be worked out efficiently.

There are six important factors affecting the cost of concrete frames in buildings, for example: (1) type of framing selected and its arrangements; (2) degree of correlation of architect's and the engineer's work; (3) economy in use of reinforcing steel; (4) simplicity and repetition in formwork; (5) use of finished concrete surfaces to eliminate plastering, and (6) adaptability of architectural details to concrete construction.

In the selection of type of framing, it should be remembered that there are four basic points: standard beam and girder, flat plate, wide beam and slab, and beam and two-way slab.

Of the four, the last named is definitely the most expensive. A choice among the others should be made on the basis of comparative cost studies of the typical bays. Generally, for FHA type housing, the flat plate will prove to be the most economical.

Once the type of framing has been decided, the framing layout should be carefully worked out with the architect so as to provide flat ceilings in rooms. Beams, girders and columns should be located and sized so that furring will be reduced to a minimum. This may, admittedly, result in some waste of concrete, but this waste is generally more than offset by savings in the furring. By the same token, column spacing should be taken into account—within certain limits, the smaller the span, the more economical the construction.

In the matter of coordination: The shape of the building is important; as a rule, rectangular shapes are more economical than angular plan layouts. The ratio of the building perimeter to the floor area also is important—the smaller this ratio the greater is the economy. Setbacks and penthouse apartments; projections, such as balconies and cornices add to the cost.

In considering the use of steel, it should be remembered that in reinforced concrete work today, reinforcing is the most expensive item. Reduction of cost of reinforcing can be accomplished by using simple reinforcing patterns and few bar sizes and by eliminating bent bars if possible.

Methods of decreasing reinforcement

The amount of reinforcing can be reduced by several means: first, by selecting the proper framing for the job; secondly, by making careful analysis of the frame and through use of greater depth of slab and beam than a balanced design would indicate. Additionally, the use of high-strength concrete will contribute to savings, since the higher allowable stresses for bond and shear will reduce some bar lengths and diminish the number of stirrups. Repetition of patterns is also desirable.

Concrete framing for a recently built apartment house in New York City cost $2.04 per sq. ft. with controlled concrete and simplified formwork as compared with $2.50 per sq. ft. for another house of the same type designed for average concrete and custom-made forms. On another housing job, one pound of steel was saved (about 10c.) per square foot of floor area by an exact analysis of the frame as compared with use of moment coefficients.

Simplicity in design and uniformity in framing will allow maximum re-use of forms. Beam sections should be made to suit standard lumber dimensions as much as possible, to reduce cutting. Depth of beams should be as uniform as possible and typical floor and roof plans should enable the same set of forms to be used for both.

Dropped arches, depressions in the floor and similar deviations should be avoided and floors made level wherever possible. Column sizes should be uniform. For example, in a ten story building one change in column size is usually all that is necessary. And if flat-plate framing is used, the same column section could be used throughout. Columns should be no less than 10-in. minimum dimension, and rectangular shapes should be used.

It is desirable to use controlled concrete throughout a structure. The additional cost as compared to the cost of average concrete is more than offset by other savings. However it should be remembered that controlled concrete, to fulfill its function, must really be controlled.

High-strength mixes may also be recommended. There is no need to limit the mix to 3,000-psi. strength. The author recently designed and supervised construction of a 12-story housing project where 3,500-psi. concrete was used in floors and columns, with very satisfactory results.

A very substantial saving can be accomplished by eliminating plastering of ceilings and other exposed concrete surfaces. Such surfaces can now be produced in concrete, ready for painting.

Forms need to be carefully built and aligned to obtain such a surface. A lining of coated plywood should be used and care taken to have the edges of the sheets fit close together. The re-use of such lining is limited, and it is generally advisable to inspect carefully the ceiling above fifth floor level for surface blemishes.

Other points where savings can be made are in details of the structure.

Stairs—Reinforced concrete stairs, scissors type, are cheaper than metal stairs. Forms built of steel sections and plates reduce cost.

Roof—Flat roof is more economical than a pitched roof.

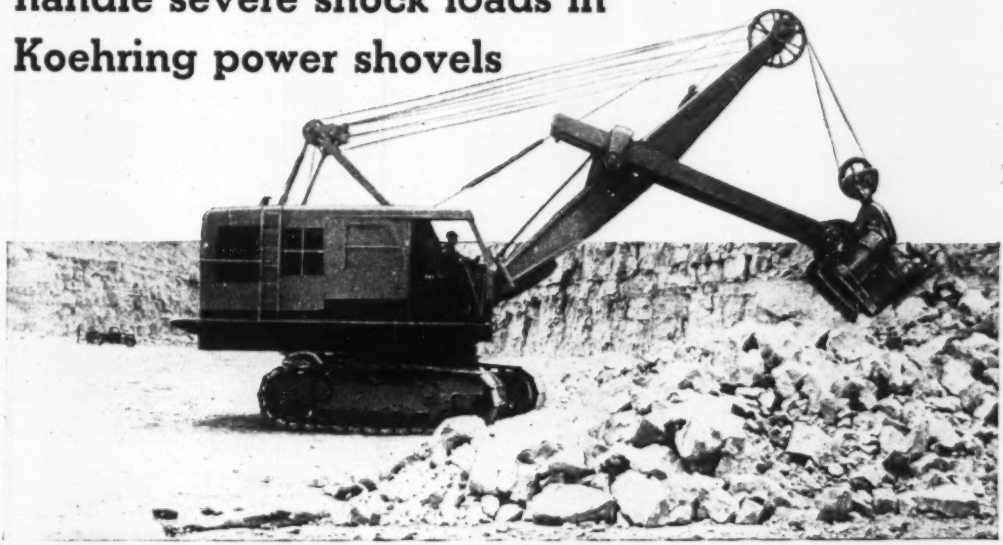
Partitions—Block partitions are easier to fit into a concrete frame than those of metal lath and plaster. Channel runners for metal lath and plaster partitions need to be fastened to the concrete ceiling, which is a slow operation. However, guns that shoot concrete nails into the ceiling are now available for such overhead work.

Openings in Floor—Plumbing slots, usually two per bathroom, suffice to eliminate horizontal runs of pipe. Large openings should be kept away from columns in flat slab construction.

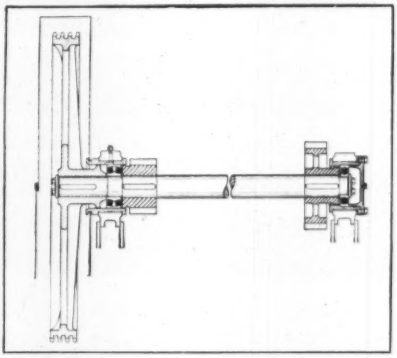
Bathroom—No fill required. Plumbing elbows should be concealed in the floor slab.

Floor Finishes—Floors should be level; saddles should take up the difference in elevation of finished floors.

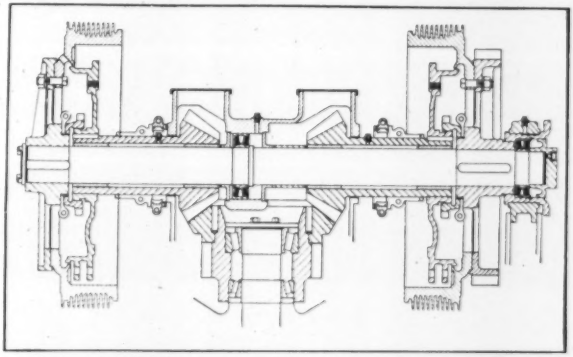
Torrington Spherical Roller Bearings handle severe shock loads in Koehring power shovels



Power Shovels made by Koehring Company, Milwaukee, are built to withstand the severe shocks and strains encountered in this rugged service. Among many advanced engineering features is the use of Torrington Spherical Roller Bearings on the swing and traction shaft and the countershaft. They compensate for deflection and prevent binding under shock loads.



Cross-Section of the countershaft shows how a Spherical Roller Bearing is used to maintain free-rolling alignment despite the overhung sheave and sudden stresses of operation. These heavy-duty bearings carry high loads with an ample margin of safety.



Two Spherical Roller Bearings are used on the horizontal swing and traction shaft. Here, too, the self-aligning feature is important, insuring accurate alignment of bearings spaced some distance apart. Because they carry thrust loads in either direction, these bearings also locate the shaft axially, preventing play and helping to minimize wear on bevel gears.

To power shovels, vibrating screens, hammer mills, rock crushers and other heavy-duty equipment, Torrington Spherical Roller Bearings bring operating advantages. Our engineers will gladly help you in adapting them to the machinery you make or use. Write us today. THE TORRINGTON COMPANY, South Bend 21, Ind., or Torrington, Conn. District offices and distributors in principal cities of United States and Canada.

TORRINGTON SPHERICAL ROLLER **BEARINGS**

Spherical Roller • Tapered Roller • Straight Roller

Needle • Ball • Needle Rollers

They dish out 32-ton bites ... from scoop to nuts!

IN AN EFFICIENT strip mining operation, coal-flow schedules don't allow waste motion.

From the time coal is scooped from near-surface veins until it is washed and graded down through "nut" size in the tipple, every move counts.

That's why you see giant Internationals working here.

Their job is to keep coal scuttling, in 32-ton loads, from massive shovels to final processing. And how they do it!

If you think you see an application to *your* job, listen to this: International W models were originally developed to tote timber in rugged western areas. They are now being used in oil fields, mining, heavy construction and other operations where powerful, *specialized* trucks deliver advantages you can't get any other way.

And like all International Trucks, "specialized" is the middle name of these big "W" brutes. They range from 30,000 to 90,000 pounds gross weight rating. Diesel, gas and butane engines are available, as are other components necessary to specialize these giants for your job.

Of course there are lots of other details you'll want to check to find out how profitably these massive-muscled bruisers can work for you. Just call your nearest International Truck Dealer or Branch; you'll get the facts, fast.

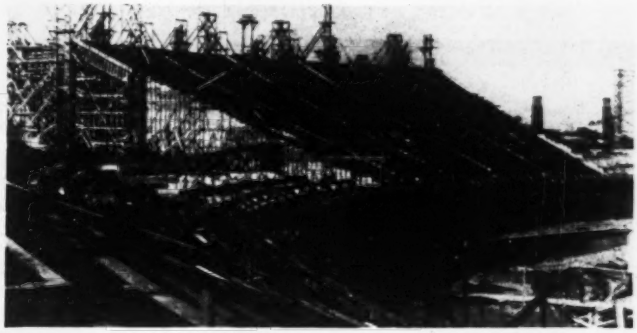
International Harvester Builds
McCormick Farm Equipment . . . Farmall Tractors
Motor Trucks . . . Industrial Power
Refrigerators and Freezers

Tune in James Melton and "Harvest of Stars"
NBC, Sunday afternoons

INTERNATIONAL TRUCKS

INTERNATIONAL HARVESTER COMPANY · CHICAGO

DEVELOPMENTS ABROAD



Rio's "Estadio Municipal"

A huge circular reinforced concrete stadium to seat upwards of 150,000 persons is well under way at Rio de Janeiro on a site about ten minutes by car from the heart of the city and near two main railway terminals.

Started last year, it is being rushed for completion by June, 1950, when it will be first used for the World Football Association (soccer) championship game. Later on, other features will be added to this great Brazilian sports center—a basketball bowl, a gymnastics field, tennis courts, swimming pools and an orchestra shell.

The total cost will be about $7,500,000. To pay for it 3000 permanent seats of concrete will be offered for rent for five years at about $250 each, which renters will be entitled to occupy for all athletic events during that period. Thus the city hopes to finance the whole construction without any taxation.

A typical South American feature is a concrete trench to separate the playing field from the stands to prevent spectators from charging onto the field when they disapprove of a player's performance or a referee's decision. The trench is about nine feet wide and nine feet deep. It can be filled with water to make a moat.

Of the 60 reinforced concrete columns, the tallest will be 108½ ft. high. Each contains 100 small steel rods.

The dimensions of the playing field are about 358 x 244 ft. Parking space of 113,000 sq. ft. inside the stadium grounds will be available. The Central do Brasil Railway and the Leopoldina Railway are nearby.

Architects are Antonio Dias Carneiro, Pedro Paulo B. Bastos, Orlando Azevedo and Rafael Galvao. Structure calculations were made by Antonio Alves Noronha, Paulo R. Fragoso, Sergio Marques de Souza and Alberto R. Costa.

Six firms are doing the contracting. Severo Vilares, Cristiani-Nielsen, Companhia Construtora Nacional, Empreza Construtora Humberto Menescal, Cavalcanti Junqueira and Construtora Dourado.

Installations for electricity, water and sewage are being handled by Empreza Nacional de Instalacoes and Sociedade de Instalacoes Tecnicas.

New V.D.I. Haus in Dusseldorf

About 2,500 German engineers from all zones of Germany last month attended the 79th annual general meeting of the Society of German Engineers (Verein Deutscher Ingenieure) in Düsseldorf on the Rhine—the first such meeting since the war.

A feature of the meeting was the dedication of the new 4-story home of the society (the V.D.I. Haus) in Prinz Georg Strasse.

This building has been put up on the site of two bombed out dwellings. It contains the library, reading room, and administrative offices. In the upper stories are editorial and publication sections of the "V.D.I Zeitung," and its associated publications.

Water Supply

Australia—Australia is about to undertake the greatest engineering feat in her history, diverting a river on one side of the Australian Alps so that it flows into rivers on the other side.

Headwaters of the Snowy River will be made to flow west and north across the mountains into the upper Murry and Tumut rivers, instead of flowing eastward and southward as the river now does.

Its new artificial course will be cut through the mountains, then directed through natural valleys. It is all part of a huge hydroelectric project to cost Australia many millions of dollars over a period of years.

An artificial water hole to collect rain water, 32,000,000 gal. of it, has been completed at Ilfracombe, Queensland. It is claimed to be the largest ever excavated in Australia and it will supply the town for two years without replenishment by rain.

It is 5 ft. deep from ground level, with banks 5 ft. high, and when within 2 ft. of the crest of the banks, the water will be 63 ft. deep. The dam has been excavated in the bed of a dry creek. It is in the center of a surface catchment area of 16 sq. mi., which will be herringboned with drains leading to the reservoir. An electric pump will lift the water to a filtering and chlorination plant and to a 60-ft. steel tower with a capacity of 100,000 gallons.

The excavation was carried out with 2½-, 5- and 6-cu. yd. scoops. More than 100,000 cu. yd. were moved. The job took eighteen months to complete, including six weeks lost because of wet weather.

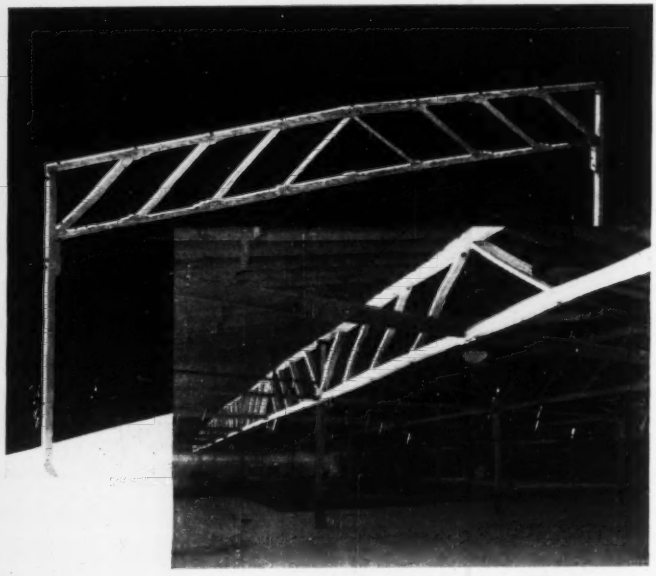
Morrison-Knudson & Co., Inc., Idaho contracting firm, has offered to build Australia's Eildon Weir in five-and-a-half years, half the time scheduled in government plans. This was disclosed by an official of the Department of Water Supply in Victoria.

Puerto Rico—The Puerto Rico Aqueduct and Sewer Authority reports that approximately $12,000,000 out of the $22,700,000 revenue bonds (series 1949) recently offered for sale through a New York banking syndicate, will be used in part for the completion of the Rio Grande de Loiza filtration plant and other projects, as well as for the construction of new water supply systems in several municipalities of the island.

The authority will use $7,500,000 to pay loans (short term) to the Puerto Rico Government Development Bank, $1,500,000 to pay to the Federal Works Agency for the Cidra hydroelectric plant and water supply systems constructed by the Army during the war, with all its installations and equipment, and $829,000 for payment of outstanding bonds belonging to several municipalities located on the island.

Note: The designers of the Buenos Aires apartment building pictured on page 47 of our Oct. 13 issue were Eduardo F. Catalano, Paul O. Grego and Francisco Degiorgi.

Rx for Flat Top Buildings



Unobstructed floor space, attractive appearance and maintenance-free construction are provided for buildings of nominal roof drainage by the Tim-Flat truss.

Available in spans from 40 to 100 feet and longer this truss has solid glued laminated chords of fire resistive dimensions. Material for chords is kiln dried before lamination, and will not shrink, warp, twist or check. Camber is retained without maintenance. No re-tightening of bolts is required. Length of chords is limited only by shipping requirements. Cross section of chords is graduated to develop required stress without needlessly increasing weight.

Thrust pads of proper depth and shear area are welded permanently to chords where helpful to economically develop end reactions of diagonal members. This truss develops for the first time in timber construction certain design advantages previously available only in competing materials.

FOR BUILDINGS OF ANY WIDTH

The Tim-Flat truss is frequently used for multiple span buildings, with columns extending through to the top chords, and with vertical loads supported on corbles. To minimize height of parapet walls, roof line at the outside of the building frequently follows the end diagonal member.

Your nearest Timber Structures office will gladly give you detailed information about the Tim-Flat truss. Or write direct to us for literature and data.

TIMBER STRUCTURES, INC.

P.O. Box 3782-B • PORTLAND 8, OREGON

Offices in Boise, Idaho; Eugene, Oregon; Lawrenceville, N.J.; Chicago; Dallas; Kansas City; New York; Seattle; Spokane

TIMBER STRUCTURES, INC., OF CALIFORNIA — Oakland and Sacramento

Local Representatives Coast to Coast

OBITUARY

Herman Beal, 87, retired city engineer of Omaha, Neb., died Oct. 11. He had lived in Omaha for 71 years. He first worked there for the Burlington and Missouri River Railroad as locating engineer. He was later engineer of South Omaha and Douglas County. Assistant engineer for seven years, he was city engineer from 1921 to 1933 when he retired.

Kenneth Stone Hall, 61, engineer for the Portland Gas & Coke Co., Portland, Ore., died Sept. 25. He was a lieutenant in the Army Engineers in World War I. Afterwards he was with the Oregon State Highway Department for four years. Before joining the gas company staff he served with the Civil Aeronautics Administration.

Karl L. Ludwick, 64, engineering graduate of the University of Nebraska, died at Los Angeles, Calif., Oct. 6. He was an efficiency expert with the department of public works of Los Angeles County.

Albert Nething, 69, Ravenna, Ohio, former city waterworks engineer, died Sept. 17.

George D. McNaughton, 71, a former structural engineer with the Bethlehem Steel Co., died at Monmouth Beach, N. J., Oct. 9.

Clayton N. Ward, 59, a civil engineer and partner of Ward & Strand, Madison, Wis., consulting engineering firm, died Oct. 5. He took his civil engineering work and master's degree from the University of Michigan. In 1916 he joined the University of Wisconsin engineering faculty as associate professor in hydraulic engineering. In 1925, he went with the firm of Mead & Seastone and in 1933 became a partner and chief engineer of the Mead, Ward & Hunt firm. The firm of Ward & Strand was organized in 1946. Mr. Ward was identified with the investigation and design of hydroelectric projects, including those at Prairie du Sac, Wisconsin Dells.

Jay J. Garfield, 64, died in Tucson, Ariz., Sept. 15. A builder of much of Tucson's skyline, his projects included the large Pioneer Hotel and University of Arizona stadium, nine schools and several large buildings in Phoenix during his 22 years in the construction industry.

CHOOSE . . . as others have —
THE MODEL THAT BEST FITS YOUR NEEDS!

There's a Schramm Air Compressor, size and model, to meet your specific needs!

Below are listed nine of the many Schramm models, portables ranging from 20 to 420 cu. ft. of actual air, the stationary ranging from 2 to 600 cu. ft. displacement.

On all models performance records are evidence of their high quality. You will find the name Schramm written on every important page in compressor history.

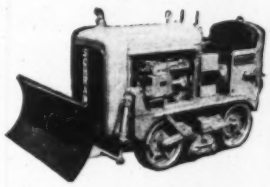
Features you get in Schramm are: 100% water cooled, assuring ideal performance summer and winter; mechanical intake valve, forced feed lubrication, and electric-starter starting. All Schramms are compact, lightweight, easy to operate.

We invite you to write today for fully illustrated catalog describing in detail each of the Schramm Air Compressors shown here . . . plus a wide range of other models. We feel the Schramm story is a good one, and offers you a sure way to get your many compressed air jobs done quickly, efficiently, and economically.

SCHRAMM INC.

THE COMPRESSOR PEOPLE • WEST CHESTER • PENNSYLVANIA

20/35 Model Compressor



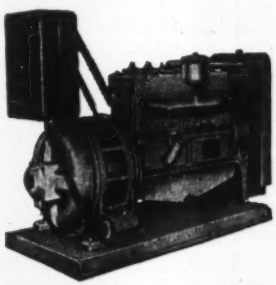
Self-Propelled with Hydraulic Backfill Blade

Two-Wheel Trailer Mounting with Tool Boxes

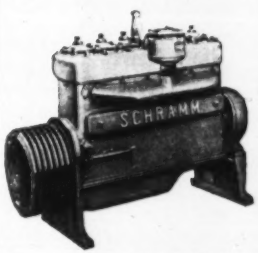
Skidded for Truck Mounting

Truck Mounted

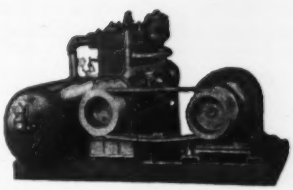
Diesel Engine Drive



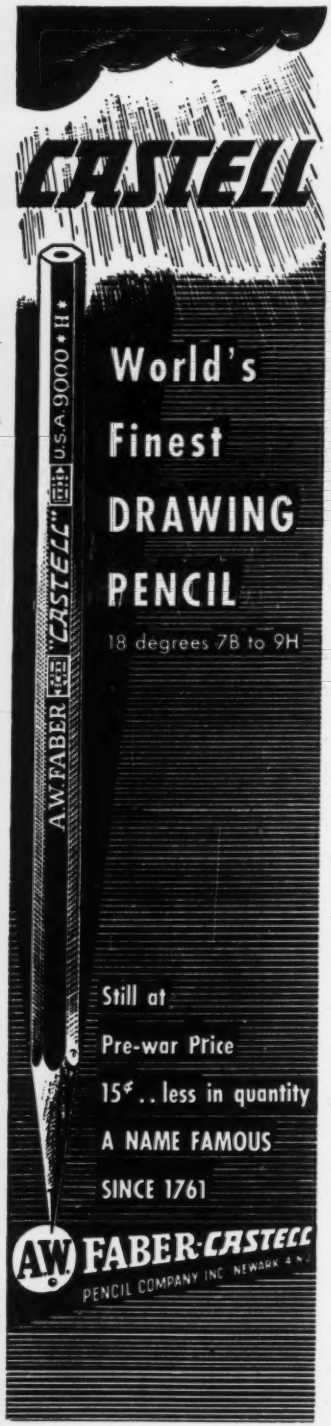
Built-in Motor Drive with Cooling Unit and Starter



"V" Belt on Flat Pulley Drive



"V" Belt Drive with Air Receiver



MUNICIPAL AFFAIRS

GRADING AND STRUCTURES for the Cleveland rapid transit line are practically all in place already, and poles are in place for the overhead wires and underpasses, due to the foresight of the Van Sweringens. The prepared right-of-way above parallels the tracks of the Nickel Plate and New York Central railroads from far out on the East side to an almost equal distance on the city's West side.

New Rapid Transit System Assured For Cleveland

A 13-mile rapid transit system, to cost $16,000,000 and expected to be in operation in a little over two years, was virtually assured for Cleveland, Ohio, as a result of an Oct. 4 election there.

At that time a 54 percent majority of the voters approved an amendment to the city charter which will revise the city's transit administration to conform with the terms of the Reconstruction Finance Corporation for a $22,200,000 loan to build a rapid transit system and improve existing carrier facilities.

The amendment sets up a 5-man board in place of the present three, and removes control of the system from the city council. Present members, William C. Reed, William C. Keogh and Victor Cohen, will be named to the new board, taking office Dec. 1. Possible appointment of a labor representative is seen, as organized labor supported the transit plan. This is a matter to be decided in the near future.

Passage of the amendment means that construction on the rapid transit system can start after city council authorizes insurance of mortgage revenue bonds to obtain the loan, and after agreements are negotiated with the Nickel Plate and New York Central Railroads and the city of Shaker Heights for right-of-way and joint use of tracks. First construction contracts will be let within nine months to a year, although the possibility of earlier construction is seen.

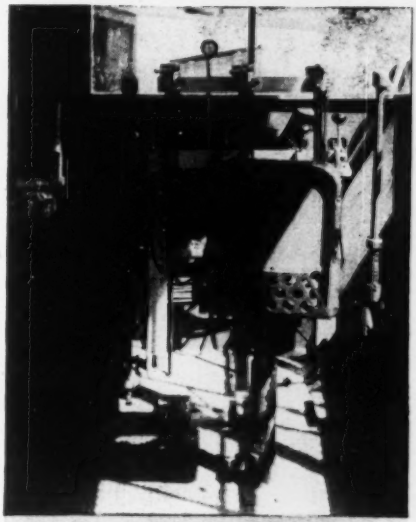
Present plans call for the eastern end of the transit line to be completed by Jan. 1, 1952, and the western portion one year later. The system will extend from the Windermere Station at Doan Avenue in East Cleveland to Union Terminal, and from the Terminal west to Madison Ave., N.W. at W. 117th St.—a distance of 12.99 miles. Connections to the rapid transit route will be made at each of 13 rapid transit stations by feeder lines carrying passengers from outlying points or by crosstown bus routes which cross the rapid transit route.

Engineers under the direction of Morse W. Rew, superintendent of power and engineering for the Cleveland Transit System, will design stations, bridges and underpasses. Since most of the rapid transit right-of-way is already graded and equipped with bridges, supports for overhead wire and a few stations, the bulk of the construction work will be on five underpasses and pedestrian subways.

Much of the work already done was completed several years ago by the Nickel Plate Railroad, under the Van Sweringen Brothers, who foresaw the coming need for the extension of the rapid transit system.

(*Continued on page 60*)

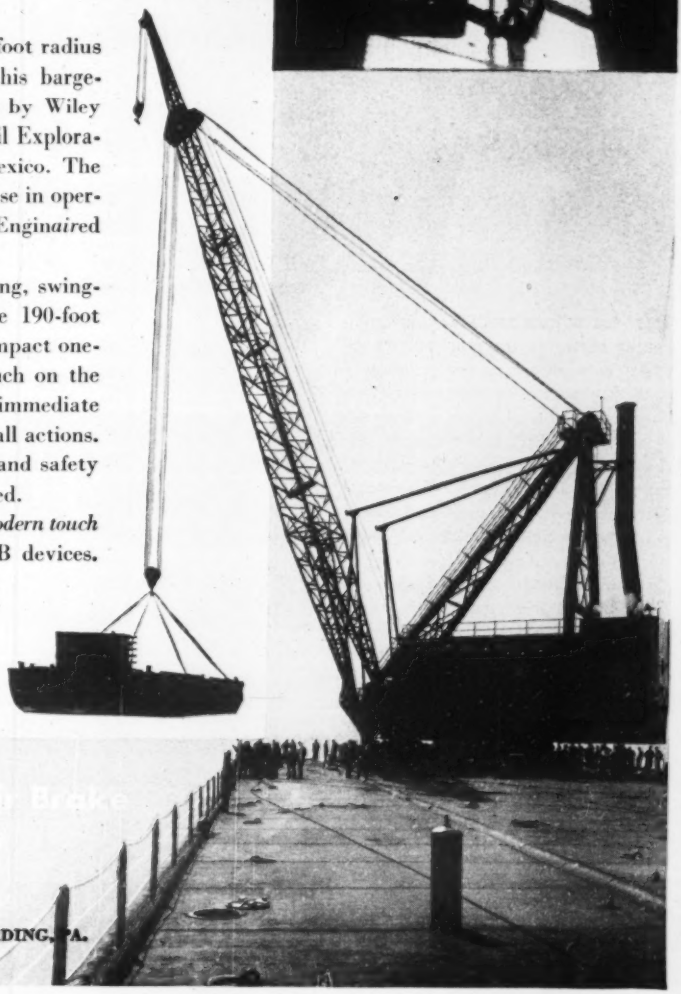
W·A·B Enginaired Controls give CENTRALIZED COMMAND of this giant WILEY CRANE



Handling a 152-ton load at 80-foot radius is all in the day's work for this barge-mounted Floating Crane, built by Wiley Manufacturing Company for Oil Exploration Service in the Gulf of Mexico. The increased size brought no increase in operating complications, for W·A·B Engin*aired* Controls were installed.

Complete command of hoisting, swinging, and all movements of the 190-foot boom is centered in a small, compact one-man control stand. A mere touch on the various W·A·B valves produces immediate positive response, and initiates all actions. Operator fatigue is eliminated, and safety and certainty definitely improved.

Wiley Cranes offer the final *modern touch* in controls . . . through W·A·B devices.

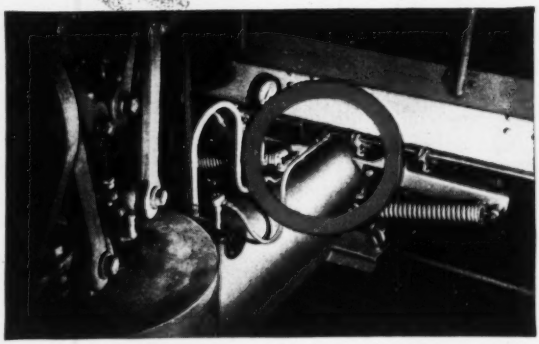


Westinghouse Air Brake Company

Industrial Division . . . WILMERDING, PA.

Which one of these pipe hangers is the right one . . . for this spot?

THIS BIG BOILER LEAD from a superheater outlet at the stop and check valve in a power station presents a critical problem in pipe suspension. From its position when cold to its position at 900°F., this piping travels through all three planes — vertical, lateral and longitudinal. That would set up dangerous stresses and strains if its great weight were not fully supported at every point of its travel by Grinnell Constant-Support Hangers. Your piping problems may be much less complicated but, whatever the problem, Grinnell offers you a complete service . . . Grinnell piping supplies, Grinnell engineering, Grinnell warehouse service, and Grinnell jobbers in practically every city and town.



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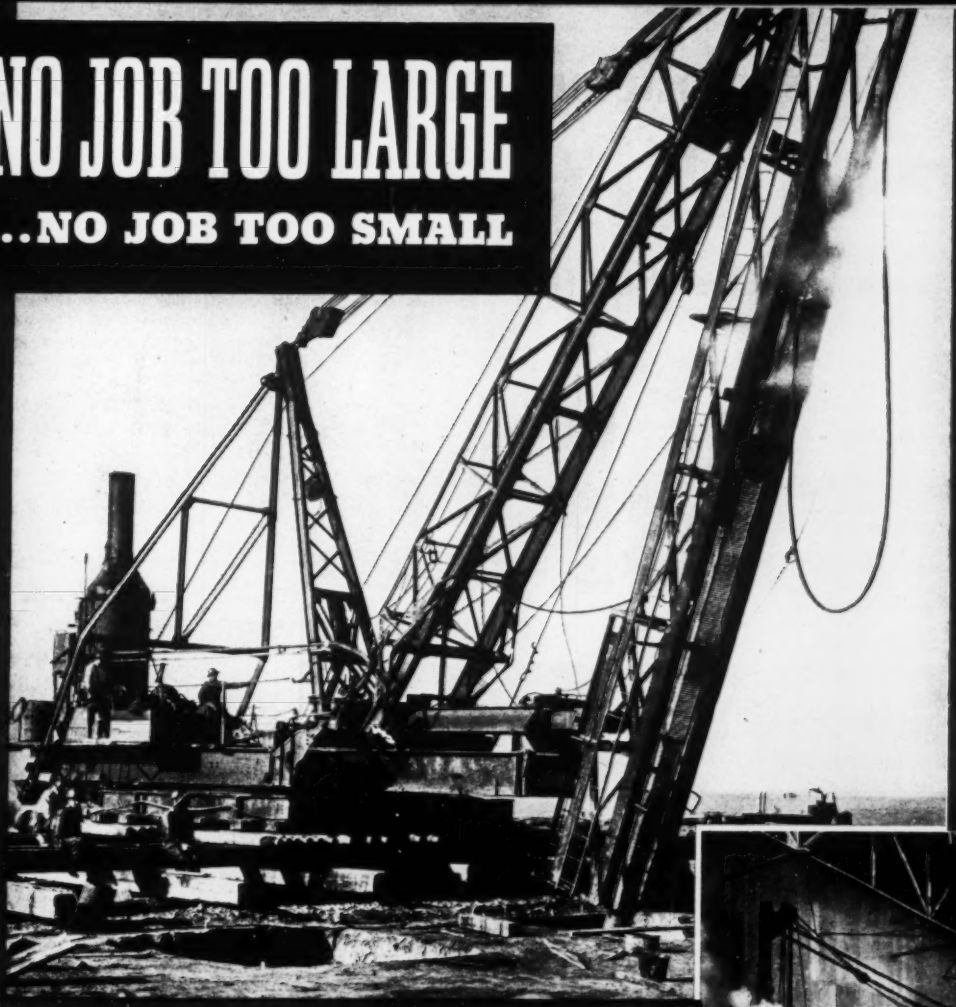
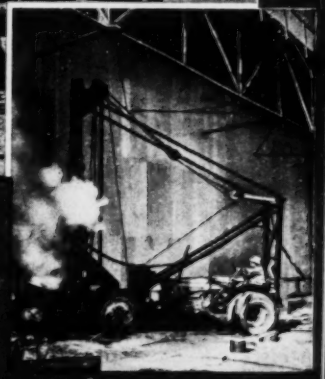
Grinnell Company, Inc., Providence, R. I. Branch warehouses: Atlanta • Buffalo • Charlotte • Chicago • Cleveland • Cranston • Fresno • Kansas City • Houston Long Beach • Los Angeles • Milwaukee • Minneapolis • New York • Oakland • Philadelphia • Sacramento • St. Louis • St. Paul • San Francisco • Seattle • Spokane

NO JOB TOO LARGE

...NO JOB TOO SMALL





AROUND THE WORLD

52 YEARS FOUNDED 1897 OF PROGRESS

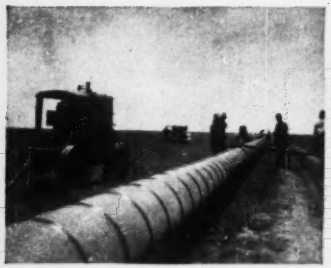
RAYMOND CONCRETE PILE CO.

140 CEDAR STREET • NEW YORK 6, N. Y.

Branch Offices in Principal Cities of United States and Latin America

SCOPE OF RAYMOND'S ACTIVITIES includes every recognized type of foundation construction concrete, composite, precast, steel, pipe and wood piles. Also caissons, underpinning, construction involving shore protection, shipbuilding facilities, harbor and river improvements and borings for soil investigation.

Why Contractors Specify NAYLOR Light-Weight Pipe

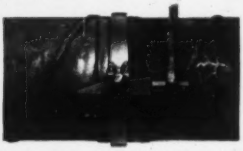


• Its light weight makes Naylor Pipe easy to handle and install.

• Its exclusive Lockseam Spiralweld structure gives Naylor Pipe the extra strength required so it doesn't have to be "babied" on those tough jobs.

• The spiral truss assures additional collapse strength—enables Naylor to serve ventilating jobs no other light-weight pipe can handle.

• The Naylor reinforced structure makes possible the high salvage and re-use value of this distinctive light-weight pipe.



• The Naylor Wedge-Lock Coupling, designed for use with Naylor Pipe, makes connections quicker and easier than ever before possible.

Specify Naylor Pipe for high and low pressure air and water lines • Push-pull ventilating • De-watering and drainage • Dredging • Hydraulic sluicing • Sand and gravel conveying • Well-point systems • Cement pumping • Composite piling • Exhaust and intake piping

Sizes from 4" to 30" in diameter, thicknesses from 14 to 8 gauge. Lengths up to 40 feet. All types of fittings and connections.

Naylor Pipe

NAYLOR PIPE COMPANY

1248 East 92nd Street, Chicago 19, Illinois

New York Office: 350 Madison Avenue, New York 17, N. Y.

Fare on the rapid transit is expected to be five cents above that on the surface lines—now 13 cents—which will cover interest and principal payments on that part of the RFC loan used for rapid transit and for annual rental of the right-of-way.

In addition to the $16,000,000 for construction of the rapid transit, C.T.S. plans to spend $2,088,000 for 46 rapid transit cars, $1,845,000 for 135 new motor buses to replace streetcars on all but three of the city's lines, and $2,267,000 for improvement of shops and garages, as well as overhead trackless trolley wiring, and miscellaneous building improvements.

Toronto's 30-Year Plan

Toronto, Canada's second largest city, has a new master plan for civic improvements to cover a 30-year period. Announced by the Toronto Planning Board, it will cover traffic arteries, new civic squares, park and recreation area expansion, new use for islands in Toronto Bay, and improvements to city water and sewage systems for 30 years to cost $179,000,000 at present values. The plan has been three years in the making by a group of citizens with the mayor and city planning commissioner active on the board.

The major feature of the plan is development of new traffic arteries to take express traffic into and out of the city from the downtown business area. This includes three arteries to connect with highways leading to northern resort and suburban areas, and an east and west express highway along the Lake Ontario waterfront. The chain of small islands forming the protected Toronto Bay and port, are to have a motor highway on them for the first time. The islands are to be transformed into areas for apartments and hotels instead of small cottages and homes as at present.

Other improvements include the building of four civic squares in the downtown area, new civic administration and welfare centers, a $50,000,000 expansion of the water and sewerage systems and a $30,000,000 program of improvements and expansion of parks and recreational areas. New hospitals, homes for the aged, health centers, court house, jail and police headquarters are in the plans. Reclamation of blighted areas in older parts of the city is also included in the 30-year plan for Toronto.

The plan is the seventh to be put before the city since the turn of the century. Others were not followed, but in case of the present plan some of its features, especially as regards traffic improvements, already have been put into operation.

How LOW Can Loading Costs Get?

Austin Overshot Loader in large Colorado quarry mining operation where scientific research subjects all costs to the keenest analysis.

The AUSTIN OVERSHOT LOADER is fast piling up proof of its ability to drop loading costs well below the figures on older types of loading and mucking equipment in the 1½ to 3½ yard class.

It is an economical built-on attachment for crawler type tractors—100% mechanical operation thru a power takeoff Cable Control Unit. Single lever gives tractor operator complete, instantaneous control of his load at all positions.

STRAIGHT-IN-LINE LOADING—no swings or blocking...does its own cleaning and sweeping...highly efficient in close quarters...and in tunnel work the loader alone is on the working face, requiring no room at either side for trucks.

SPECIAL ATTACHMENTS

...can be field installed on loader arm... Timber Forks, Bulldozers, etc.

Write for New Informative Bulletin

JOHN AUSTIN INC.
Denver 2, Colo.

Facts you should know

about the New General Motors Diesel Engine-Torque Converter Unit

Two 190 H.P. 6-Cylinder GM Diesel Engine-Torque Converter units power the new 34-ton Euclid 1-FFD tandem axle rear-dump. Each engine drives one rear axle, eliminating the conventional inter-axle power divider. A 3-speed Allison Torqmatic transmission does away with the clutch pedal and manual shifting. Designed for off-the-highway haulage of large tonnage, the mammoth 1-FFD has a top speed of 25.4 m.p.h. with full pay load.

ONE MANUFACTURER ONE RESPONSIBILITY The new torque converter is specifically designed and manufactured by General Motors as an integral unit with the Series 71 two-cycle Diesel engine. Result: a big saving in size and weight—no compromise designs—no divided responsibility.

AUTOMATIC SHIFT FROM TORQUE MULTIPLICATION TO FLUID COUPLING Desirable features and advantages of *both* torque converter and fluid coupling are combined in this converter. Continuous *automatic* transition from 3.6-to-1 torque ratio at stall speed to 1-to-1 torque ratio in fluid coupling. Unit goes into fluid coupling whenever load requirements equal engine torque, without regard to output shaft speed.

MORE WORK IN LESS TIME This new power unit gets the most work done in the least time. Because it is not rigidly geared to the load, the engine responds to the throttle and immediately accelerates to a high output range regardless of the speed of the load.

FREEDOM FROM SHOCK LOADS Transmission of power through a liquid, cushions both engine and driven machinery from sudden shock loads. Operation is liquid-smooth (free from jerks) at any speed or throttle setting.

FREEDOM FROM STALLS WITH OVERLOAD Fluid circuit prevents engine stalling under any load condition. Ability to exert a smooth pull at any output shaft speed down to zero permits GM Converter-equipped machines to do some operations that are impossible with conventional units.

EASE OF HANDLING Eliminates time lost in unnecessary low gear operation. Operator fatigue is reduced. Work is speeded up with less effort on the part of the operator.

WIDE RANGE OF MODELS The new GM Diesel Engine-Torque Converter unit is made available in 3-, 4- and 6-cylinder single engine units, Twin 4 and Twin 6 multiple engine units with engine ratings from 64 to 294 B.H.P. to meet a wide range of power requirements. *Write or wire for full details.*

DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES... *Up to 200 H.P.* **DETROIT 28, MICHIGAN** MULTIPLE UNITS... *Up to 800 H.P.*

GENERAL MOTORS

DIESEL BRAWN WITHOUT THE BULK

GM GENERAL MOTORS DIESEL POWER

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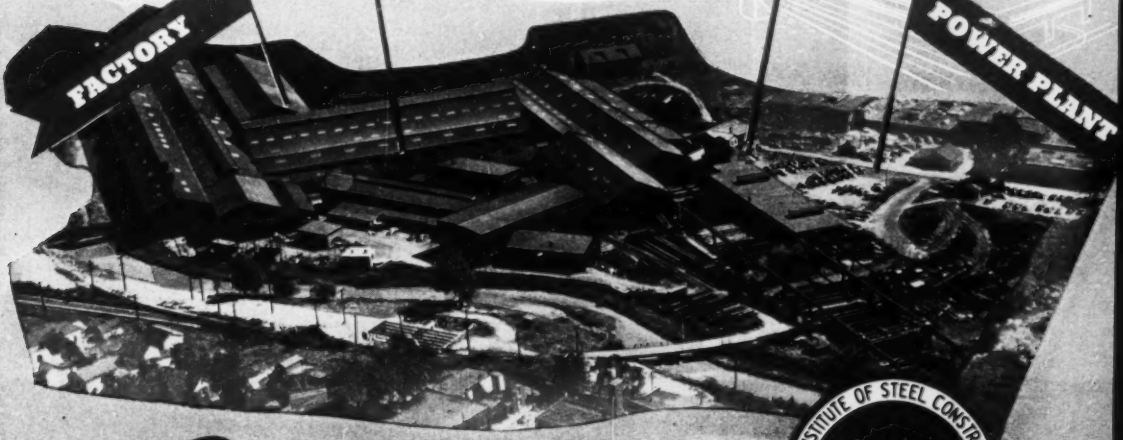
FORT PITT BRIDGE

when dependable service and promised delivery are important.

Unexcelled fabricating facilities . . . 53 years of structural steel fabricating experience . . . an excellent record of delivering *when* promised, make Fort Pitt Bridge an important source for the fabricating and erection of structural steel.

FACTORY

POWER PLANT



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Engine Power for the Excavating Industry

Today you can have the long life and dependable work-power of "Caterpillar" Diesel Engines in your larger excavating machinery. The leading manufacturers of excavators are able to supply "Caterpillar" Diesel power in nearly every size of machine they build, at your request.

The list includes:

American Hoist & Derrick Co.
ST. PAUL, MINN.

Bay City Shovels, Inc.
BAY CITY, MICH.

The Browning Crane & Shovel Co.
CLEVELAND, OHIO

Bucyrus-Erie Company
SOUTH MILWAUKEE, WIS.

The Byers Machine Company
RAVENNA, OHIO

Dominion Hoist & Shovel Co., Inc.
MONTREAL, CANADA

The General Excavator Co.
MARION, OHIO

Harnischfeger Corporation
MILWAUKEE, WIS.

Industrial Brownhoist Corporation
BAY CITY, MICH.

Insley Manufacturing Corporation
INDIANAPOLIS, IND.

Koehring Company
MILWAUKEE, WIS.

Lima-Hamilton Corporation
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Manitowoc Engineering Works
MANITOWOC, WIS.

Marion Power Shovel Co.
MARION, OHIO

Northwest Engineering Co.
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Orton Crane & Shovel Co.
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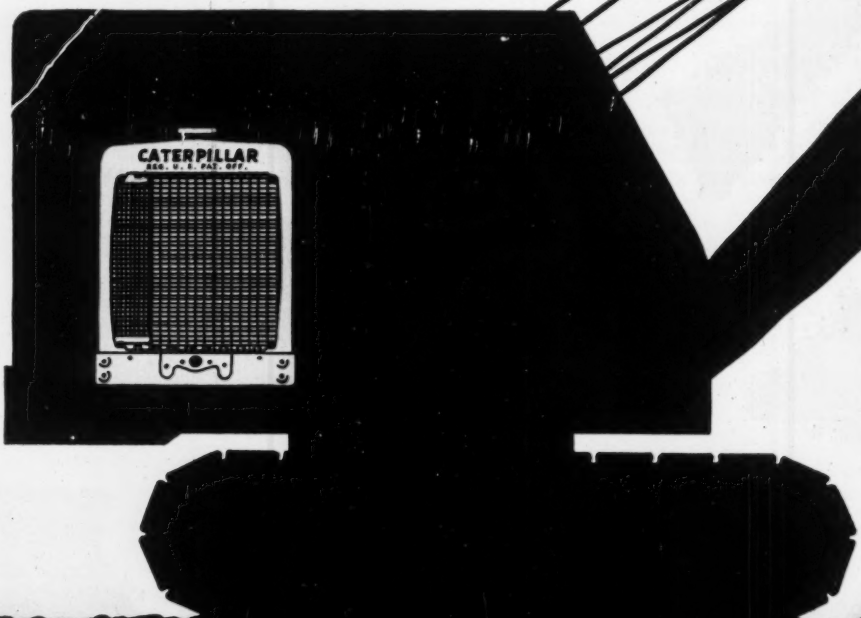
The Osgood Company
MARION, OHIO

Sargent Machine Co., Inc.
FORT DODGE, IOWA

The Thew Shovel Company
LORAIN, OHIO



CATERPILLAR TRACTOR CO.
BOX EN-10, PEORIA, ILL.

Send me full information and specifications on "Caterpillar" Diesels for excavating machinery.

Name_____

Address_____

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REG. U. S. PAT. OFF.
DIESEL

ENGINES • TRACTORS
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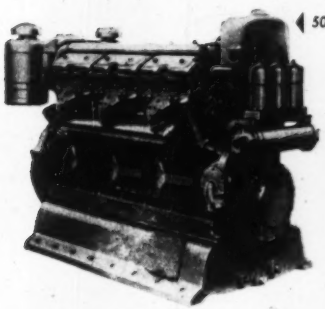
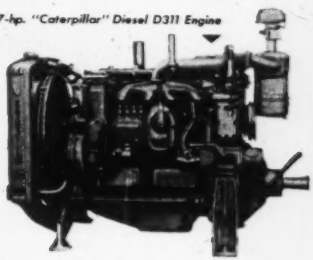
EARTHMOVING EQUIPMENT

"Cat" Diesels can now handle your biggest excavating power requirements



500-hp. "Caterpillar" Diesel D397 Engine

47-hp. "Caterpillar" Diesel D311 Engine



With the addition of four new, bigger engines, "Caterpillar" Diesels are now available in 10 sizes, rated at 47 to 500 horsepower for excavator work. Even your electrically driven excavators can be powered by multiple hook-ups of "Cat" Diesel Electric Sets—affording you maximum reliability and greater economy. Mail the coupon for further information.

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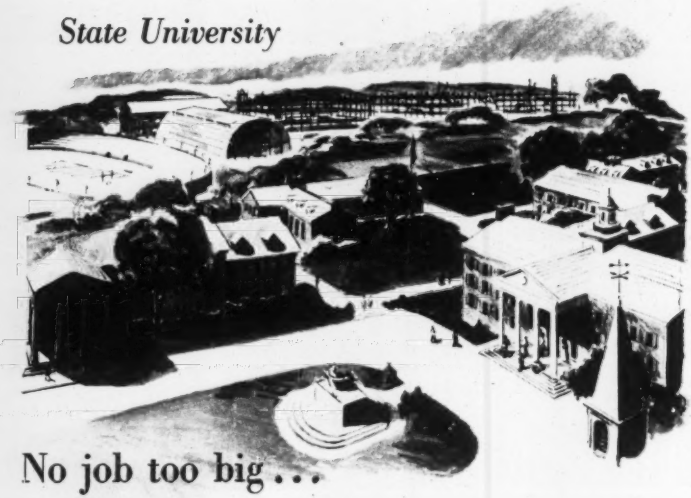

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The contractor who deals with Ætna can rely on prompt, friendly, nation-wide service — on jobs that are large or small, simple or complex.

Architects, owners and public officials from coast to coast know and respect Ætna's facilities and reputation. And contractors find that this company's broad experience with the most complex bonding problems results in progressive underwriting policies and intelligent service.

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HARTFORD 15, CONNECTICUT

Elections and Activities

Associated General Contractors of America has nominated Walter L. Couse, president of the Walter L. Couse Co., Detroit, Mich., as president, succeeding Adolph Teichert, Sacramento, Calif. Nomination is tantamount to election and officers will be installed at the 31st annual convention in San Francisco, Feb. 27-March 2, 1950. Glenn W. Maxon, Dayton, Ohio, was nominated to succeed Couse as vice-president. The governing and advisory boards recommended that federal agencies which certify or establish wage rates in various areas do so in a manner which will not disrupt actual prevailing wage rates. "The association condemns practices of agencies of the federal government which disrupt normal collective bargaining procedures in the construction industry," the statement said. It claimed that the Department of Labor had certified wage rates for public works projects higher than those actually prevailing in the area or higher than those in effect during collective bargaining.

Toledo, Ohio, Technical Council has elected Chester A. Colwell, president; William F. Rohr, vice-president; and L. W. Dittlebeck, secretary-treasurer.

MAJOR MEETINGS

American Public Health Association, Hotel Statler and Hotel New Yorker, New York City, Oct. 24-28.

37th National Safety Congress, Stevens Hotel, Chicago, Oct. 24-28.

National Conference on Industrial Hydraulics, Sheraton Hotel, Chicago, Ill., Oct. 26-27.

Engineers Council for Professional Development, Edgewater Beach Hotel, Chicago, Oct. 28-29.

American Institute of Steel Construction, Greenbrier Hotel, White Sulphur Springs, W. Va., Oct. 31-Nov. 3.

Building Officials Conference of America, Wardman Park Hotel, Washington, D. C., Oct. 31-Nov. 4.

National Reclamation Association, Hotel Newhouse, Salt Lake City, Utah, Nov. 2-4.

American Society of Civil Engineers, fall meeting, Hotel Statler, Washington, D. C., Nov. 2-4.

National Council of State Boards of Engineering Examiners, Sheraton Plaza Hotel, Daytona Beach, Fla., Nov. 10-12.

National Association of Housing Officials, Hotel Statler, Boston, Mass., Nov. 13-16.

PROOF - *not Guesswork*

Makes FWD America's Foremost Heavy-Duty Truck

Here's actual operating proof in typical highway maintenance service. This FWD Maintainer, carrying a load of gravel, has just come out of a sharp curve on the way to location. Yes — with power on all wheels, FWD Trucks give you the extra traction to take tight turns safely. You can be sure of this even before you buy, because FWDs are scientifically tested on the FWD proving ground to speed over a 100-ft. unbanked circle without skidding. *No wonder FWD Trucks are the number one choice of states, counties and municipalities — with individual fleets of over 300 units!*

WHAT FWDs DO ON THE PROVING GROUND
1 Highball over hilly curved roads!
2 Slog thru mud — up to the bumper!
3 Speed over 100-ft. unbanked circle!
4 Twist over ditches — 18 inches deep!
5 Drive up 6% grade thru 3-ft. of sand!
6 Climb 70% grade from dead stop!
7 Climb 8-in. beam from standstill!
8 Drill pole holes to prove equipment!
9 Speed safely over level highways!
1
2
3
5
7
8
9

This is FWD's proving ground. This is your assurance that the FWD you select has the stamina to insure long life without expensive mechanical breakdowns.

An FWD speeds over the 100-ft. unbanked circle at the proving ground. For all the facts about FWD trucks, see your FWD distributor — or write direct.

An Invitation To Truck Buyers

We invite you to watch FWDs pass a series of rigid performance tests. Ask your FWD distributor to arrange your visit to our plant. Or — if you can't get away, ask him to show you the movie, *The FWD Story*. In either case, you will see for yourself how FWD trucks can help solve your heavy-duty trucking problems.

Marvin C. Coe
President
The Four Wheel Drive Auto Company

H-1

THE FOUR WHEEL DRIVE AUTO COMPANY
Clintonville, Wis. • *Canadian Factory:* Kitchener, Ontario
FOUR AND SIX WHEEL DRIVE TRUCKS

America's Foremost Heavy-Duty Truck

Bridges go up FASTER and at less cost . . .

with AMCRECO Creosoted PRODUCTS

Timbers • Piles • Planking

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Bridge Ties

When you use Amcreco creosoted materials for bridge construction, you gain the double advantage of speed and economy. Framed bridge timbers go up faster and Amcreco's tried and proven pressure creosoting methods provide low first cost and minimum maintenance expense. On your next bridge job plan to take advantage of this double-barreled benefit. Amcreco engineers will be pleased to assist in every way possible. Write for full information, today.

Pressure treated by the Lowry Process for strength that lasts!

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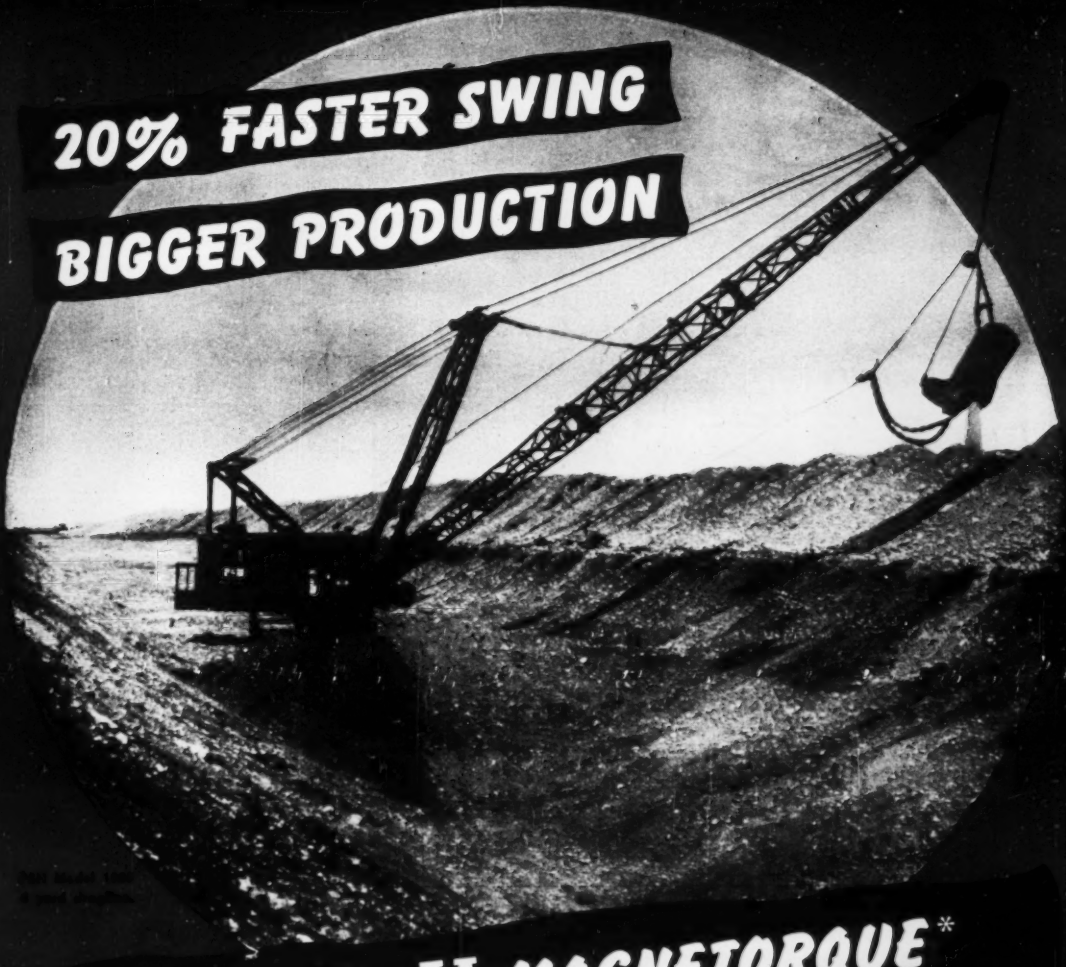
LOOK TO P&H FOR ADDED VALUES . . .

20% FASTER SWING
BIGGER PRODUCTION



WITH P&H MAGNETORQUE*

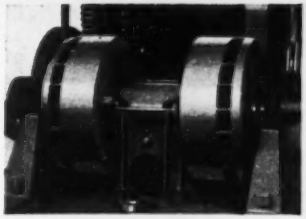
With swing taking about 70% of the average digging cycle, figure what the P&H Magnetorque means to you in bigger production. With 20% faster swing, you can make 5 complete digging cycles to 4 on other machines.

Smoothness means easier operation — velvety starts and stops — far less strain on machinery and structural members.

There's all the difference in the world between conventional swing mechanism and the P&H Magnetorque. If you don't have the facts, it's to your advantage to get them. Write us.

P&H **EXCAVATORS**
4404 West National Avenue
Milwaukee 14, Wisconsin

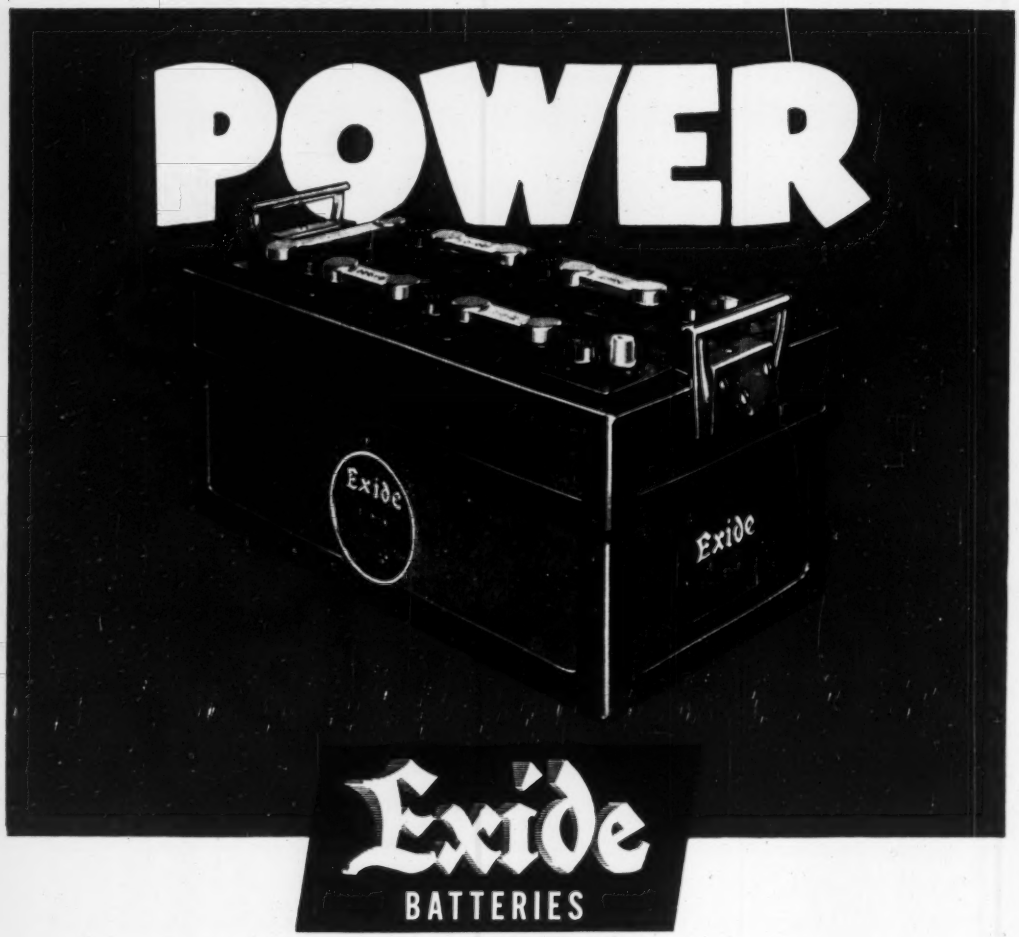
HARNISCHFEGER CORPORATION



The P&H Magnetorque unit eliminates the ordinary swing assembly and all its troubles — transmits power electro-magnetically without friction, without mechanical wear. The Magnetorque lasts the life of the machine. Write for Bulletin X-104.

*T.M. of Harnischfeger Corporation for electro-magnetic type clutch.

EXCAVATORS • OVERHEAD CRANES • ARC WELDERS and ELECTRODES • MOTORS, STARTERS • CRAWLER and TRUCK CRANES • DIESEL ENGINES • CORE DRILLERS • PRECISION-BUILT WELDERS



the Diesel Cranking Battery designed specifically for the job

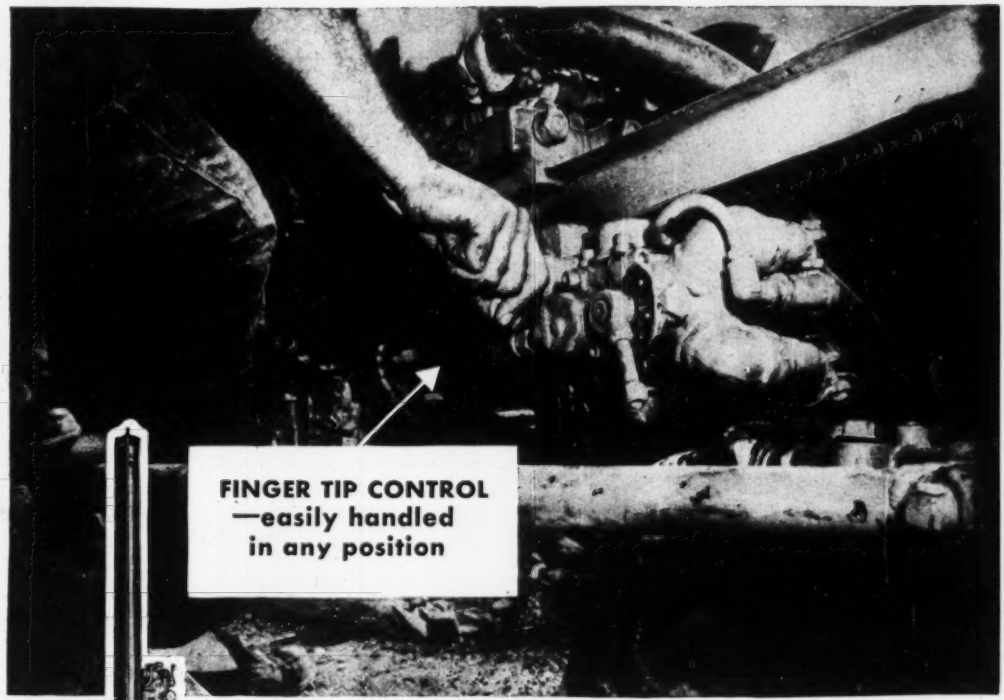
Exide Diesel Cranking Batteries discharge at high rates and maintain high voltage. They're built to stand the rigors of hard service in off-the-highway and on-the-highway equipment . . . to give trustworthy performance in all climates . . . and to keep at it month after month.

You can always count on Exide Batteries for dependability, long life and low cost maintenance. Consult Exide engineers regarding any of your Diesel cranking problems. Their long experience in this field will prove valuable to you.

1888 . . . DEPENDABLE BATTERIES FOR 61 YEARS . . . 1949

"Exide" *Reg. Trade-mark U. S. Pat. Off.*

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32 • *Exide Batteries of Canada, Limited, Toronto*



The PIONEER and still the LEADER!

JOY LIGHTWEIGHT WAGON DRILL

Introduced by JOY 8 years ago—hundreds in use, nation-wide . . .

HERE'S WHY:

Consult a Joy Engineer

- MORE HOLE PER SHIFT with the *exclusive* "drill and blow" feature.
- REALLY LIGHTWEIGHT—only 750 lbs.—less than half the weight of conventional wagon drills.
- Easily operated by ONE MAN; mounts JOY 3" or 3½" drifters, or 55 or 65 lb. sinkers.
- POSITIVE LOCKING BRAKES—requires no spikes.

WRITE FOR BULLETIN

W&D C 2073

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GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

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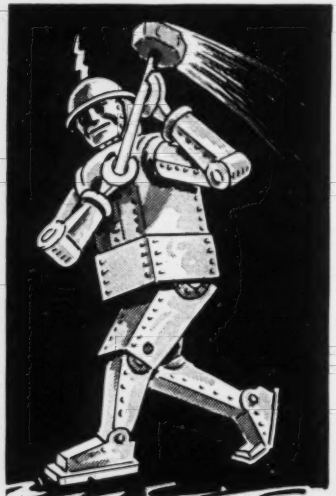

ENDURANCE
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SUPER-VULCAN
OPEN TYPE
DIFFERENTIAL-ACTING
PILE HAMMERS
18C, 30C, 50C and 80C

● When the job is finished, the last pile battered down, your Super-Vulcan is ready to go again. Toughness, strength, dependability, endurance are built right into this powerful pile hammer. They combine with simple design and easy operation to cut maintenance costs to the bone and to boost the tested positive action of this machine to maximum efficiency.

The Super-Vulcan drives wood, concrete or pipe piles, steel sheeting or H beams. It fits the same leads and uses the same accessories as Warrington-Vulcan single-Acting Pile Hammers.

Write for complete details today.

VULCAN IRON WORKS
Since 1852
331 North Bell Avenue
Chicago 12 ---Illinois

MEN AND JOBS

Robert L. Reisinger, Jr., a civil engineer who for the last year and a half was associated with W. C. Kruger & Associates, architects and engineers, of Santa Fe, N. M., for the U. S. Atomic Energy Commission at Los Alamos, has rejoined the Robert L. Reisinger Co., general contractors, Milwaukee, Wis.

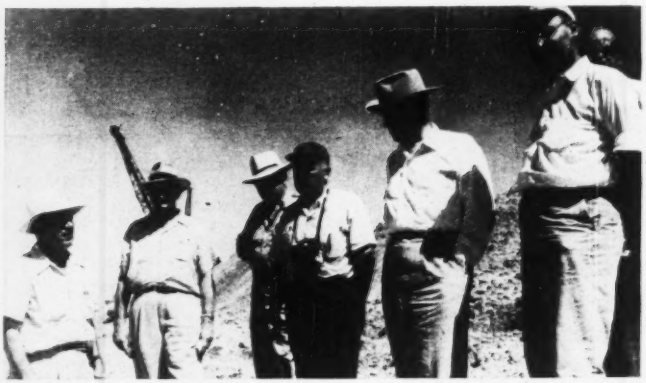
William Hoenig, maintenance engineer for Wisconsin since 1929, and associated with highway work since 1907, has retired.

Roy Jensen, who has been highway commissioner of Calumet County, Wis., since 1935, has been appointed a member of the Wisconsin Highway Commission.

Butler Carrington, construction division statistician and for 17 years an employee of the Kentucky Department of Highways, has been promoted to assistant director of the division of design. **C. J. Fuller,** chief locating engineer, is being named an assistant director of the division of design. Mr. Fuller will continue to direct all location work along with added duties in the new highway program. He has been with the department 25 years.

(*Continued on page 74*)

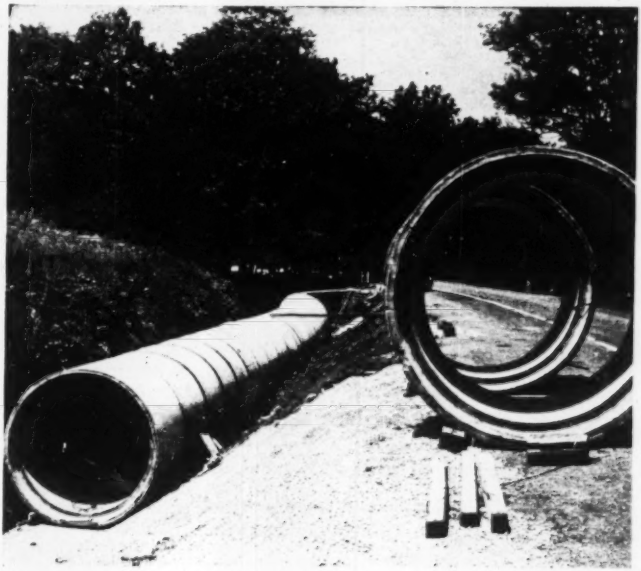
Topics of conversation probably were Prepakt concrete and grouting at this conference in the new office addition to the Corps of Engineers Waterways Experiment Station's concrete research laboratory at Clinton, Miss. Left to right, V. L. Minear, engineer, Office of the Chief of Engineers; H. K. Cook, chief, Concrete Research Division; L. S. Wertz, president Prepakt Concrete Co.; W. J. Turnbull, chief, Soils Division, and W. K. Boyd, chief, Flexible Pavement Branch, Soils Division, of the waterways experiment station.



When the recent Florida hurricane hit the Lake Okeechobee region the $24,000,000 U. S. Engineer-constructed dike around the lake proved its worth and suffered only relatively minor damage. Inspecting the damage and repair work are, left to right, A. R. Broadfoot, resident engineer at Clewiston; Col. R. W. Pearson, district engineer, Jacksonville; C. P. Lindner, chief engineer, South Atlantic division, Atlanta; G. A. Hathaway, Office of Chief of Engineers, Washington, D. C.; Col. B. L. Robinson, division engineer, South Atlantic Division, Atlanta; and F. B. Slichter, Office of Chief Engineers, Washington, D. C.

HEADQUARTERS

With Purchase Advantage to You for . . .



- **Whatever you want in Vitrified Clay Pipe.**
- **Whatever you want in Concrete Pipe.**
- **Whatever you want in Allied Products.**

WHEREVER YOU ARE LOCATED . . .
CENTRAL STATES TO EAST COAST
AND GULF.

Check Universal Vitrified and U. S. Concrete

For factual information as to the proper pipe to use for a given job, check Universal Vitrified—U. S. Concrete. Here you will find no distortion of facts—no prejudice either way between vitrified and concrete. The thing of interest is the manufacture of the best pipe (or other products) for the job—no matter what the job. Charged with this responsibility, engineers and laboratory technicians are spending their time in constant study for new techniques that bring you better products . . . the most for your dollar. Their knowledge, their advice, their suggestions are always yours for the asking.

Check with Universal Vitrified—U. S. Concrete for factual information and suggestions regarding your jobs.

SALES OFFICES:

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FACTORIES:

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Palmyra, Ohio (2), Uhrichsville, Ohio (2).

UNIVERSAL SEWER PIPE CORPORATION
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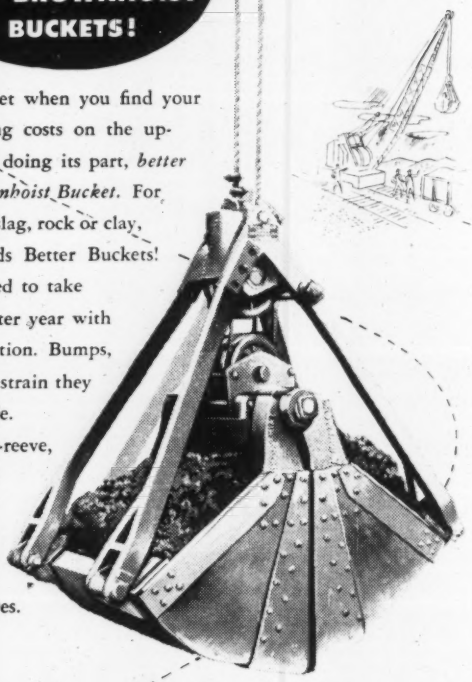
If you're digging for profits
BUY BROWNHOIST BUCKETS!

Check your bucket when you find your materials handling costs on the upgrade. If it isn't doing its part, *better change to a Brownhoist Bucket.* For coal, ore, sludge, slag, rock or clay, Brownhoist Builds Better Buckets! They're engineered to take full bites, year after year with trouble-free operation. Bumps, shocks, stress and strain they take in their stride. Available in rope-reeve, power wheel and link type. *Write for latest catalog* of Brownhoist Buckets and features.



INDUSTRIAL BROWNHOIST CORPORATION • BAY CITY, MICH.

Stang WELLPOINT SYSTEM

For KNOW-HOW • ENGINEERING • SUPERVISION • EQUIPMENT • to keep jobs DRY

The Stang System has proved its efficiency and economy on both large and small jobs all over the United States. Stang engineering and supervision in planning, installation and operation insures a DRY JOB at all times.

JOHN W. **STANG** CORPORATION
2 Broadway, New York 4, N. Y. — 2123 S. 56th St., Omaha, Nebr. — 8221 Atlantic Ave., P.O. Box 631, Bell, Cal.

Appointment of **Berchmans T. Fitzpatrick** as Deputy Administrator of the Housing and Home Finance Agency has been announced to fill a new position created by the Housing Act of 1949, to rank with those of the heads of the three HHFA constituent agencies—the Federal Housing Administration, the Home Loan Bank Board and the Public Housing Administration. Mr. Fitzpatrick has served in legal and administrative positions in connection with government housing programs since 1938 and has also served as assistant administrator for program operations.

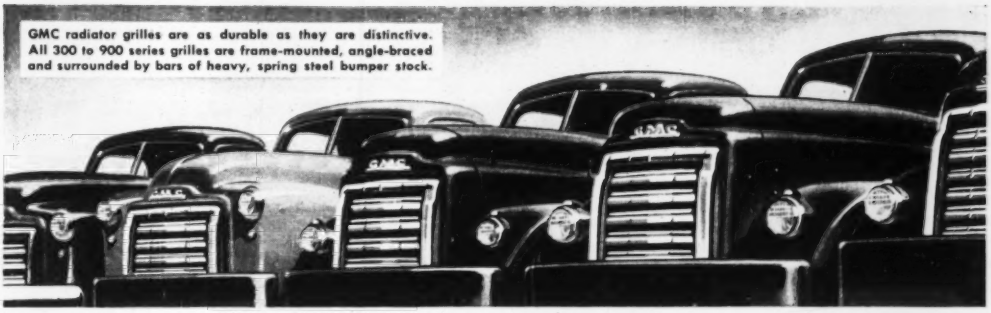
C. F. Lee has been appointed Kentucky chief engineer for Southern Bell Telephone & Telegraph Co., Louisville, Ky.

Harry W. Terry, consulting engineer of Scarsdale, N. Y., has opened a New York City headquarters at 518 Fifth Avenue. He was graduated from Syracuse University and later studied sanitary and industrial analysis of water at the University of Minnesota. He is the designer of mechanical, electrical and sanitary equipment for buildings for many architects, including those of the Grand Central Terminal, New York City. Colonel Terry entered the Army in January, 1941, and he served four years with the Corps of Engineers.

Stephen M. Batori, Seattle, consulting engineer, has formed Stephen Batori & Co., engineers and consultants, with offices at 200 James Street, Seattle. He formerly was with the DeWitt C. Griffin & Associates, engi-

(Continued on page 77)

George C. Imrie, resident engineer for the Tracy, Calif., office of the Bureau of Reclamation, stops before excavations of the Tracy Pumping Plant and intake canal. Water here will be lifted into the 120-mi. canal, which is expected to be entirely under contract by next summer.



GMC radiator grilles are as durable as they are distinctive. All 300 to 900 series grilles are frame-mounted, angle-braced and surrounded by bars of heavy, spring steel bumper stock.

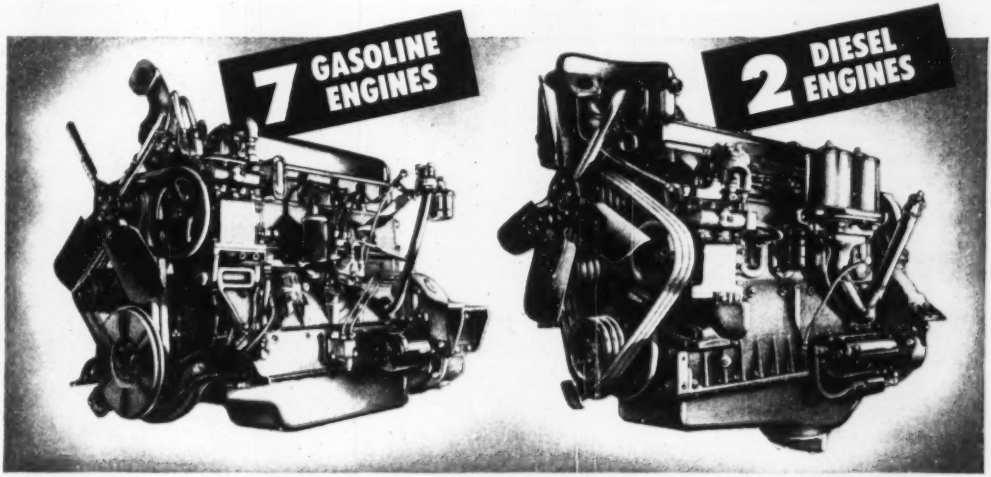
BACK OF THESE "BUMPER-BAR" GRILLES . . .

Best Engines in the Business

The increasing popularity and acceptance of GMC trucks are reflected in current registration figures which show GMC making substantial gains in new truck sales. In fact, new GMC truck registrations are the highest in the Company's history according to latest available figures.

Much of this increase can be attributed to the famous GMC truck-built engine line . . . because everyone recognizes the engine as the "heart" of any motor truck.

GMC now offers an engine range to fit every vocational requirement. Each engine, gasoline or Diesel, is the most powerful in its class with the most advanced features of design and construction ever offered by GMC. From every angle GMC truck engines are the "best in the business" . . . from every angle the best for your business.



GMC gasoline engines range from 228 to 503 cu. in. displacement and from 95 to 190 horsepower. From the smallest to the largest, they are all GMC-built . . . all of war-renowned "Army Workhorse" design.

GMC
GASOLINE • DIESEL
TRUCKS

GMC Diesel trucks are powered by famous GM 2-cycle four and six cylinder Diesel engines that are outstanding for light weight and great economy. The four develops 133 horsepower; the six provides 200.

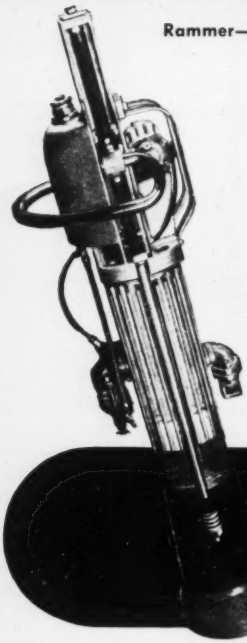
GMC TRUCK & COACH DIVISION • GENERAL MOTORS CORPORATION

EASY, INEXPENSIVE SOIL COMPACTION

The New BARCO RAMMER

Rammer—Starting

Rammer—Jumping



The new Barco Rammer is faster and more effective than any other type of tamper. It is easier on the worker, enables him to get more work done in less time, and at *lower cost.* Although rollers may do the compaction on large projects, they cannot reach locations close to abutments, culverts, walls and so on. But the new Barco Rammer remedies this situation, gives specified compaction. On large backfill tamping where a ditcher is used, the Barco Rammer works quickly and effectively. Today, with Federal, State and City authorities, as well as private corporations devoting more and more attention to these problems, the best answer is the Barco Rammer —the *entirely new* machine with the *entirely new method* of securing soil compaction. For more information write Barco Manufacturing Company, 1814 Winnemac Avenue, Chicago 40, Illinois. In Canada: The Holden Co., Ltd., Montreal, Canada.

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GASOLINE RAMMER

FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

neers. The new organization will offer investigations and reports; coordination of engineering; plant and procedure improvement; factory layout and design; equipment testing; and power development. Batori is a graduate of the Stevens Institute of Technology. During the war he served overseas as a colonel in the Ordnance Department. Upon discharge, he took a post as consultant to the Polish government and UNRRA in rehabilitation work.

Capt. Beauford W. Fink, USN, former assistant chief of the Bureau of Yards and Docks for plans and research, has retired from the Navy with the rank of commodore.

Col. David T. Johnson, Deputy Division engineer, Western Ocean Division, Corps of Engineers, became district manager at Huntington, W. Va., Aug. 25, succeeding Col. Alexander M. Neilson.

Col. John G. Ladd has been appointed commanding officer of the Army Map Service, succeeding Col. William H. Mills, who is transferring to the Industrial War College.

J. L. Fergus has been appointed assistant chief engineer of the Nashville, Chattanooga & St. Louis Railway at Nashville, Tenn.

C. W. Hartford has been appointed acting right-of-way engineer for the Ohio Highway Department, succeeding G. E. Strauss, who will become head of the newly formed real estate section of the Ohio Department of Public Works.

J. Perry Yates, vice-president, Bechtel Corp., and I. C. Steele, vice-president and chief engineer, Pacific Gas & Electric Co., pose for their pictures at the ground-breaking ceremony of PG&E's 402,000 hp. steam plant at Antioch, Calif. Contra Costa Steam Plant, scheduled for completion in summer of 1951 at a cost of $51,500,000, will have three generating units of 134,000 hp. each. Bechtel is designer and builder.

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ENGINES
FOR HEAVY-DUTY LOADS

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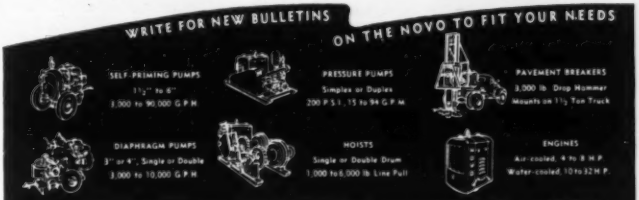

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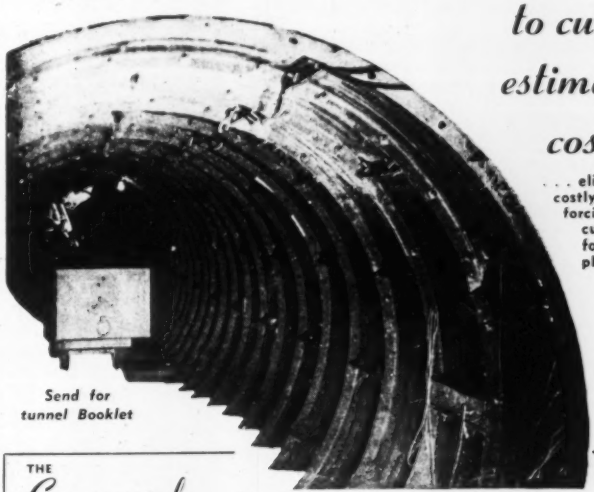

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UNIT PRICES BID BY CONTRACTORS

Highway surfacing, Clark County, Arkansas

PROJECT is 8.822 miles of gravel base course and asphaltic concrete hot mix base and surface courses on Little Missouri River-Guidon road, Clark Co., Arkansas.

OWNER is State Highway Comm., Little Rock, A. E. Johnson, chi. engr.

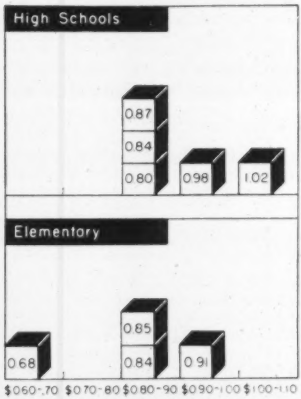
CONDITIONS: All materials are to be furnished by contractor. Skilled wages are $1 per hr., semi-skilled, $0.72 and unskilled or common, $0.62 and hr. stipulated contract time is 300 working days. Access to site is by Missouri Pacific Ry. and U. S. 67.

BIDS opened Sept. 9, 1949, high bid 14 percent above low.

1. Reynolds & Williams, Tyler, Tex (contract) $358,267
2. Ben M. Hogan & Co. Little Rock, Ark. $384,342
3. D. F. Jones Constr. Co. Little Rock, Ark. $389,545
4. T. L. James Co., Inc. Ruston, La. $408,292

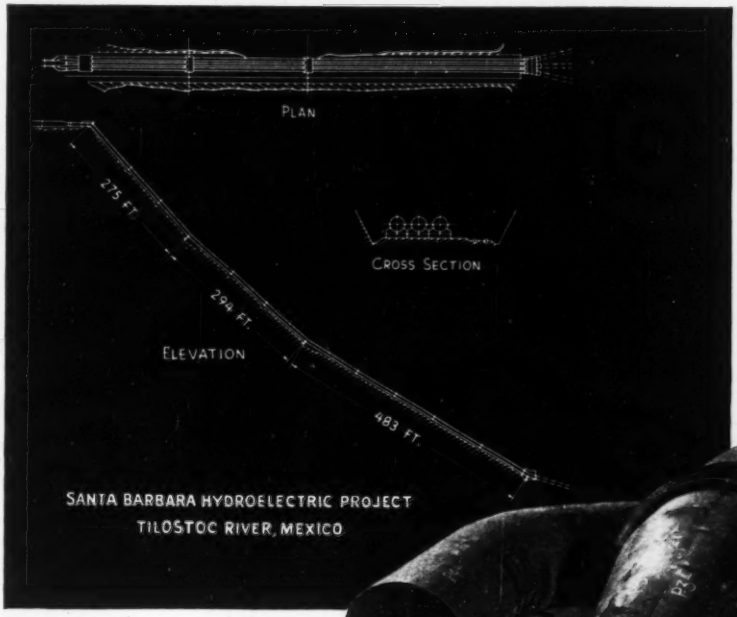
Items		Quantity	Unit Prices 1	2	3
Clearing	ac	4	$150.00	$100.00	$150.00
Grubbing	ac	3	150.00	150.00	150.00
Excav. common	cy	58,409	.29	.28	.28
Excav., dry for struct	cy	564	3.00	2.00	3.00
Excav., wet for struct	cy	123	3.00	4.00	3.00
Embank. matl.	cy	69,894	.32	.38	.38
Overhaul	st y	164,664	005	02	01
Fence, move & reconstr.	rods	719	90	90	1.00
Move bldg. Cl. III	ea	1	275.00	200.00	225.00
Cl. V	ea	7	700.00	500.00	1,150.00
Reconstr. fdns. & Appurt. Cl. III	ea	1	25.00	100.00	25.00
Cl. V	ea	7	50.00	125.00	50.00
Spec. compact'n of earthwk	cy	119,476	.03	.03	04
Grav. base Crse 1 Cl. B-1, B-2, or B-3	cy	78,577	1.10	1.16	1.12
Asph. concr. hot mix base Crse-type 1	ton	22,581	5.40	6.00	6.00
Prime coat applic.	gal	47,128	.13	.14	13
Asph. concr. hot mix surf. crse. type 3	ton	9,687	6.35	6.60	6.70
Cl. A concr	cy	470	40.00	40.00	45.00
Reinf. steel	lb	42,004	.10	.11	.11
24" reinf. concr. pipe culv.	lf	220	4.50	5.00	5.00
18" spelter ctd. CM pipe culv.	lf	526	3.00	3.00	2.50
30" spelter ctd. CM pipe culv.	lf	48	5.50	5.00	4.50
Relay culv. pipe	lf	142	3.00	2.00	2.00
Stl. plate guard fence	lf	416	2.25	2.50	3.00
Remove, & reset F.A.P. markers	ea	2	50.00	10.00	10.00
Remove & dispose of concr. pave.	sy	3,010	.50	.50	1.00
of concr. walks	sy	53	.50	.50	1.00
of cattle guards	ea	1	50.00	100.00	50.00
Remove gas pumps	ea	2	100.00	75.00	50.00
Reset gas pumps	ea	2	100.00	75.00	50.00

Unit Cost of Massachusetts School Buildings, 1949



Size (Low Bid)	Total	Heating	Plumbing	Electric
	COSTS PER CUBIC FOOT			
High Schools				
$1,759,413	$0.80	$0.093	$0.046	$0.052
1,015,000	0.98	0.090	0.043	0.033
775,000	0.84	0.094	0.058	0.050
540,400	1.02	0.130	0.073	0.072
207,031	0.87	0.140	0.033	0.020
Elementary				
643,000	0.91	0.107	0.038	0.046
461,461	0.85	0.098	0.049	0.056
395,990	0.68	0.093	0.034	0.042
298,480	0.84	0.082	0.038	0.052

Low bids on four elementary schools in Massachusetts this year range from $0.68 to $0.91 per cubic foot. Five high schools drew low bids of $0.80 up to $1.02 per cubic foot. These unit costs are reported by Leslie H. Allen, quantity surveyor, Newton Highlands, Mass. to augment the unit costs of schools published in the unit costs of schools published in ENR Sept. 8, 1949, p. 19.



Sketch of penstock for Santa Barbara project is shown at left. Complete penstock consists of 3-branch wye joined to three parallel pipes. Mayari R plates used in the pipes vary from ¼ inch at the upper end to 1 inch at the downstream end.

3-branch penstock wye of Mayari R, fabricated by Bethlehem for the Santa Barbara Hydroelectric Project, Republic of Mexico. Inlet end of wye is 126 inches in diameter; the three outlet ends are 73 inches in diameter; Mayari R plates ½-inch thick were used in this assembly.

⅓ less steel

⅓ less field welding

FOR MAYARI R PENSTOCK

Approximately 450 tons of steel were saved by designing this large penstock for Mayari R low-alloy, high-tensile steel instead of the ordinary carbon steel plate. The higher properties of Mayari R permitted it to be used in substantially thinner gages without sacrificing strength. This, of course, resulted in a worthwhile reduction in the cost of materials and shipping.

Another important saving was made during the erection of the penstock. Because of the thinner walls of Mayari R only one-half as much weld metal was needed for each joint; also, longer sections could be handled by the lifting equipment, thereby reducing the number of joints. The total cost for field welding was approximately one-third less than it would have been for a comparable penstock of carbon steel.

A highly-versatile steel, Mayari R is used to advantage in many types of fabricated structures. For full information on Mayari R, its properties and applications, write today for a copy of Catalog 259.

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BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

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Mayari R *makes it lighter... stronger... longer lasting*

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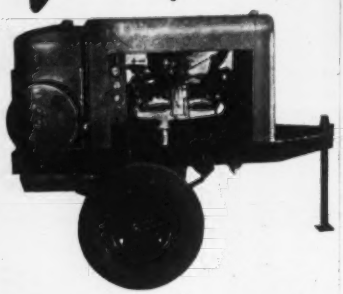

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ENGINEERING SCHOOLS

RPI'S 125TH ANNIVERSARY—Prominent at the 125th anniversary convocation of Rensselaer Polytechnic Institute, Troy, N. Y., last week were, left to right, R.P.I. President Livingston W. Houston; Charles E. Wilson, President, General Electric Co.; Louis St. Laurent, prime minister of Canada; Eugene Holman, President, Standard Oil Co. of New Jersey; H. G. Botcheller, President, Allegheny-Ludlum Steel Corp.; Amory Houghton, chairman, Corning Glass Works; and Ray P. Baker, Dean of Students and Vice-President of the institute. Not shown in the picture was another speaker, Francis T. Spaulding, Commissioner of Education and President, University of the State of New York. The general theme of the convocation, attended by many hundreds of R.P.I. alumni and industrial leaders, was "Industry and the Engineer of the Future."

Aerial Photography for Highway Work

By Donald J. Belcher

Professor of Civil Engineering
College of Engineering, Cornell University

Highway engineering students at Cornell University are now following every detail of the most advanced practice of highway location methods. The increased use of aerial photographs in the field phases of engineering makes training in these problems a necessary part of every civil engineer's education.

Following a series of conferences with location engineers and officials of the Public Roads Administration, the Palisade Interstate Parkway Commission and the New York State Department of Public Works, a complete location problem based upon actual aerial surveys was selected. This location study has the step by step reality of an executed project since it is based upon the surveys and conditions attending the design and construction of sections of the Palisades Interstate Parkway (New York-New Jersey).

Starting with the specifications for aerial photography by the Aero Service Corporation of Philadelphia, the students carry through from an examination of aerial mosaics for alternate routes to a stereoscopic examination of contact prints that establishes the location of the preliminary line and curves. Using the actual contact prints, as well as ownership maps and 5 ft. contour topograhic maps produced from the airphotos, right-of-way and drainage lines are established. Excavation computations based on the photo maps and checked by commission engineers are followed by a critique of the problem in which ground photographs, furnished by the Palisades Interstate Parkway Commission, are used to illustrate the various types of equipment and excavation and embankment materials encountered during construction. The active cooperation of Sam Nelson, deputy chief engineer of the commission, has made it possible for this comprehensive training to be given to undergraduate engineers. For those students desiring to concentrate on aerial surveys applied to engineering soil conditions, drainage maps, land planning and natural resources, advanced courses are available. Graduates now hold primary positions in aerial mapping programs of several of the states.

Notes on Legal Decisions

Summaries of decisions relating to construction prepared by I. Vernon Werbin, counselor at law and engineer, New York, author of Legal Phrases of Construction Contracts (McGraw-Hill)

Completeness of Contracts

An action was brought by subcontractors against the general contractor and its surety to recover for work done under a written contract. The general contractor tried to show that there were certain terms in the agreement which had not been incorporated in the written contract.[1] The court refused to permit such testimony, stating in its opinion:

"The test of completeness of a written contract is the writing itself, and oral evidence to show that it is incomplete is not competent. [Citing cases.] And when the writing itself upon its face is couched in such terms as import a complete legal obligation, without any uncertainty as to the object or extent of the engagement, it is conclusively presumed that the whole engagement of the parties, and the extent and manner of their undertaking, was reduced to writing. Silence on a point which might have been embodied in it does not open the door to oral evidence in that regard. [Citing cases.] When a contract complete in itself, fails to incorporate a previous oral agreement, then it must be presumed that the parties have purposely rejected the earlier oral agreement. [Citing cases.] No rule concerning the interpretation of contracts is more firmly established than that which excludes the testimony of a party to a meaning contrary to that which the law imposes upon the language of the contract. [Citing cases.] The court may not inquire into the secret or unexpressed intention of one or both of the parties. [Citing cases.]

"In Eustis Mining Co. v. Beer, Sondheimer & Co., Inc., D. C., 239F. 976, frequently cited by the courts, defendant offered in evidence a written contract which the plaintiff had submitted to defendant for signature after the execution of the contract sued on but which defendant refused to sign as evidence showing plaintiff's interpretation of the contract sued on. In holding the contract inadmissible for the purpose offered, Judge L. Hand said in 239 F. at pages 984, 985:

" 'It makes not the least difference whether a promisor actually intends that meaning which the law will impose upon his words. *** Hence it follows that no declaration of the promisor as to his meaning when he used the words is of the slightest relevancy. *** Indeed, if both parties severally declared that their meaning had been other than the natural meaning, and each declaration was similar, it would be irrelevant, saving some mutual agreement between them to that effect.'

"The fact that the parties agreed upon the later execution of a more formal and detailed contract does not permit the reception of evidence inconsistent with the terms of the contract which they have written. Williston on Contracts, Rev., 1936 Ed. section 633. Neither the formal contract offered in evidence by the defendant, nor the proof of prior negotiations of the parties leading up to the signing of the contract sued on was receivable in evidence to establish an intention of the parties contrary to that expressed in the writing itself."

ENR Jan. 6, 1949, p. 75 under "Oral vs. written Evidence" refers to other cases on this subject.

Where the written contract does not set forth the actual bargain that the parties made, the remedy is to have the written instrument reformed.

(1) Maryland Casualty Co. v. United States, 169 F. 2d 102, Circuit Court of Appeals, Eighth District, Aug. 3, 1948.

Who is a Contractor?

In some states, as in Arkansas, persons engaging in the business of general contracting are required to obtain licenses to conduct such business. A person engaged at a weekly salary to superintend the construction of a building is not a "general contractor", or engaged in the business of contracting.

A "contractor", in law of building contracts, is one who contracts to construct works or erect buildings at a certain price or rate, and is ordinarily understood to mean a person who undertakes to supply labor and materials for specific improvements under a contract with the owner.[1]

(1) Arkansas State Licensing Board for General Contractors v. Lane, 215 S. W. 2d 707 (Supreme Court of Arkansas, Dec. 20, 1948).

Withdrawal of Bid

The reference to an earlier issue of Engineering News-Record in an item headed "Recission of Bid" in the issue of Sept. 29, p. 46, was in error as to the date. It should have been ENR July 8, 1948, p. 118, not 1949.

How The School Board "Discovered" a New Building

and Saved the Taxpayers 40-50%

Everybody's happy in Payson, Ill., with their new five-room Butler Steel School Building.
TAXPAYERS—because total cost of the *permanent* building was "approximately 40 to 50 percent less than... if constructed from ...brick, masonry, etc."
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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N.Y.

ELSIE EAVES, Manager — *J. A. MAHONEY, Reports* — *M. R. ROESSLER, Statistics*

WATER SUPPLY

BIDS ASKED

October 25

N. Y., New York—Comr. Water Supply, Gas & Electricity. Municipal Bldg., Zone 7, water mains, appurtenances in Bathgate, Netherland and Peartree Aves., and in Dawson, Grote and Kelly Sts., Bronx Boro. Plans deposit $1.

October 31

Md., Hyattsville — Washington Suburban Sanitary Comn., Hamilton St., approx. 24,850 ft. 42-in. supply line from Willis School Filtration Plant, near Laurel, to Columbia Pike, near Paint Branch, Prince Georges and Montgomery Counties. Contr. 694-W. Plans deposit $10; adv. ENR 10/27., CD 10/10.

November 2

Ont., Burlington—Alma Wilson, municipality clk., Burlington, 13,720 ft. 10- to 14-in. water mns. imprvs. CD 12/20/45.

November 4

Pa., Meadville—City, Municipal Bldg., WW imprvs., incl. Contr. 1, general construction Contr. 2, electrical work, and Contr. 3, waste water and spent brine sewer. Plans deposit $5. The Chester Engineers, 210 E. Park Way, Pittsburgh, Zone 12, engrs. CD 2/21/45.

November 7

N. Y., New York—Bd. Water Supply, 120 Wall St., Zone 5, clearing approx. 900 acres below Elevation 760, in lower portion of Rondout Reservoir in preparation for storage of water, in Towns of Wawarsing, Ulster Co. and Neversink, Sullivan Co. Plans deposit $5. CD 6/16/44.

Tex., Smithville—City, WW imprvs., exten., $90,000. Garrett Eng. Co., 5008 Almeda Rd., Houston, engr. CD 7/8.

November 10

Calif., Oakland—East Bay Municipal Utility Dist., 512 16 St., welded steel watermains, Spec. 1S-478. John Longwell, ch engr., CD 7/17/46.

SOON LETS CONTRACT

Tex., Houston—J. Deady Smallwood, Citizens Bank Bldg., soon lets contract c. i. water lines, facilities, for 1100 homesite units, $50,000. E. S. & Robert M. Atkinson, 745 First Natl. Bank Bldg., Houston, engrs. CD 10/3.

LOW BIDDERS

Ill., Bedford Park (Br. Chicago)—Village, 7645 W. 66 St., Bedford Park. James R. Stanley, clk., water supply sys., incl. laying mains, from Santucci Constr. Co., 5044 Carol St., Skokie, **$120,830*****D, structures, from S. N. Nielsen Co., 3059 W. Augusta St., Chicago, **$398,800*****G, two elevated tanks, from Chicago Bridge & Iron Wks., 332 S. Michigan St., Chicago, **$103,400.** CD 3/1.

Mass., Westfield—City, P. Wks. Dpt., Oct. 7 furnishing, laying c. i. watermains, various locations, from George E. Duteau, 1125 Page Blvd., Springfield, **$112,946.** CD 10/3.

N. Y., Thiells—Bureau Contracts & Accounts, Albany, Oct. 13, addnl. water storage at Letchworth Village, from Tubina Bros. Inc., Pelham, **$168,900.** CD 10/5.

†North Dakota—Bureau Reclamation, Dpt. Interior, Odon Tillin, regional dir., Bismarck, drilling water supply well for caretaker's residence at Heart Butte Dam, Glen Ullin, Spec. R6-34 (Region 6), Missouri River Basin Proj., Heart Div. Will re-advertise. CD 9/29.

N. D., Michigan City—City, Oct. 10, water and sewerage, spec. from Northwestern Eng. Co., Rapid City, **$184,86*.** CD 9/28.

Okla., Tulsa—City, Oct. 4, 11,000 lin. ft. 36 in. c. i. pipeline to West Tulsa reservoir, from Culver & McGuire, Tri States Bldg., **$247,111,** est. $300,000; 15 m. gal. concrete reservoir in West Tulsa, from Manhattan Constr. Co., Manhattan Bldg., Muskogee, **$372,178,** est. $410,000. CD 9/27.

Tex., Baytown — Harris Co. Fresh Water Supply Dist. 8, c/o R. A. Wolfe Jr., 6624 Foster St., Houston, Oct. 10, Contr. 1, c. i. watermains, from Brooks & Jones, Inc., Box 5, Houston, **$132,956,** est. Approx. $80,000. Contr. 2, elevated tanks, from Chicago Bridge & Iron Wks., Natl. Standard Bank, Houston, **$37,825,** est. $125,000. CD 9/27.

CONTRACTS AWARDED

Okla., Tulsa—City, City Hall, steam generator at Mohawk Pumping Station, to American Plumbing & Heating Co., 119 E. 5 St., Zone 3, **$124,992.** Est. $135,000. Awarded 10/12. W. F. McMurray, city engr. CD 9/27.

Tex., Houston—City, City Hall, 900 Brazos St., 51,000 lin. ft. 4- to 8-in. c. i. water pipe, to U. S. Pipe & Fdry. Co., Citizens State Bank Bldg., **$96,310*****15,000 lin. ft. 12-in. c. i. water pipe to James B. Clow & Sons, 2919 Main St., $30,400. Bids 8/17. CD 8/23, under LB.

SEWERS, WASTE DISPOSAL

BIDS ASKED

October 31

Md., Towson—Comrs. Baltimore Co. Courthouse, 1,073 lin. ft. 15- to 30-in. concrete culvert pipe, 2,155 cu. yd. rein-con. in rectangular concrete drain, 35 inlets and open catch basins, misc. items, Red. House Run Dist., 178D. Plans deposit $5. Wm. F. Neale, Courthouse, ch. engr.

November 7

Nev., Las Vegas—City, City Hall, main sewer line. Approx. $50,000. Plans deposit $5. Ralph W. O'Neill, 3023/4 S. Brand Blvd., Glendale, Calif., engr. CD 11/13/46.

November 9

California—State Div. Hys., P. Wks. Bldg., Sacramento, exten. drainage facilities between 2.5 mi. south of Live Oak and Gridley, Sutter and Butte Counties. G. T. McCoy, Sacramento, state hy. engr.

LOW BIDDERS

Calif., Los Angeles—Los Angeles Co., 501 Hall of Records, Oct. 11, sanitary sewers in Arcadia Ave., C. T. 1263, from Hermoso Constr. Co., 1689 N. Vine St., **$161,751.** Est. $142,750. CD 9/19.

Calif., San Diego—San Diego Co., Oct. 10, sanitary sewers in Glenmont Dr., from Drainage Constr. Co., Box 671, Vista, **$248,310.**

Ill., Rockford—City, Sanitary Dist., 3300 Kishwaukee St., Oct. 3, sewage treatment plant, addns., bldgs., equip. and power work, from S. N. Nielsen Co., 3059 Augusta Blvd., Chicago, Zone 12, **$622,516.** CD 8/16.

Mass., Lawrence—City, City Hall, rejected bids Sept. 26, refuse incinerator. **$270,000.** CD 10/13.

Neb., Norfolk—City, City Hall, outfall sewer, from Dutch's Excavation Co., Clear Lake, Ia., **$121,858.** CD 6/11/42.

N. J., Gloucester—Gloucester Sewage Auth., City Hall, rejected bids Sept. 16, sewage treatment plant and refuse incinerator plant, L. B. **$421,000;** mechanical, L. B. **$288,300.** Will re-advertise. CD 9/27, under LB.

S. C., Woodruff—Town, Sam Westmoreland, mayor, Oct. 11, sewerage imprvs., from Ridlehuber & Co., Inc., Greenwood, **$238,971.** CD 9/12.

Tex., Austin—City, Oct. 11, storm sewer projects in 10 different sections of city, from R. M. Smith, 1808 E. 4 St., **$119,314.** CD 9/30.

Tex., Baytown—Harris County Fresh Water Dist. 8, c/o R. A. Wolfe, Jr., 6624 Foster St., Houston, Oct. 10, Contr. 3, sewage collection lines, from Brown & Root, Inc., P.O. Box 3, Houston, **$108,869,** est. $100,000; Contr. 4, sewage treatment plant, from Gerald Mora, 312 Sabine St., Houston, **$96,815,** est. $115,000. CD 9/27.

Va., Williamsburg—City, Oct. 6, sewage treatment plant imprvs., from Vanguard Constr. Co., Ingleside St., Norfolk, **$137,774.** CD 9/22.

CONTRACTS AWARDED

Ark., Augusta—City, imprv. sewerage sys., to Worth James Const. Co., Pyramid Bldg., Little Rock, **$151,578.** CD 1/10/47.

Mich., Lansing—City, Dpt. P. Serv., City Hall Annex, Zone 7, furnishing 2 blowers and dual fuel engines, to Fairbanks-Morse Co., 217 S. 8 St., Zone 2, Mo., **$70,685;** furnishing air diffusion equipment, to Chicago Pump Co., 2336 W. Wolfram St., Chicago, Ill., **$77,-606.** CD 12/17/48.

● Neb., Omaha—City, City Hall, 18 and Farnam Sts., Benson Sewer, to Santucci Constr. Co., 5044 Carol St., Skokie, Ill., **$1,062,343.** Est. $1,200,000. Bids 10/4. CD 10/10, under LB.

● New York—President Queens Boro, 120-55 Queens Blvd., Kew Gardens, Zone 15, storm sewers, appurtenances, Harding Blvd. and 99 St.; combined sewer, appurtenances, 99 and Xenia Sts., Horace Harding Blvd.; sanitary sewers, appurtenances Horace Harding Blvd., to P. & T. Constr. Co., Brookville Blvd., Rosedale, **$1,780,422.** Est. $2,447,917. Bids 8/30. CD 9/8, under LB.

N. Y., Yonkers—City, City Hall, incinerator plant, to Poirer & McLane Corp., 1010 Nepperhan Ave., **$966,815.** Bids 8/31. CD 10/4, under LB.

O., Delaware—City, City Hall, sanitary sewers, to Circleville Constr. Co., Circleville, **$141,-223.** Awarded 10/13. CD 8/11.

Pa., Phila.—Dpt. P. Wks., City Hall Annex, intercepting sewer, Pennypack Creek, to Bucks County Constr. Co., Penndel, **$321,244.** Est $350,000. Bids 9/30. CD 9/22.

Tex., Gladewater — City, sanitary sewers, force account. **$55,000.**

Ont., Chatham—City, East End storm sewers, to Scott-Jackson Constr. Ltd., Evans Ave., Etobicoke, approx. **$112,800.** Bids 10/8. CD 9/28.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimums: **size of larger:** water supply, earthwork, waterways $28,000; other public works $50,000; industrial buildings $68,-000; other buildings $250,000.

Classes of Construction

(Name in order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
●	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

BRIDGES

BIDS ASKED

November 18

✧Missouri—U. S. Eng., Kansas City Dist., 601 Davidson Bldg., Kansas City 8, Mo., Milwaukee Bridge, Truman Bridge and Hawthorn Pumping Plants, East Bottoms Unit, CIVENG 23-025-50-66.

LOW BIDDERS

Ill., Chicago—City, City Hall, Zone 21, Peoria St. Bridge, of West Rte. Super Hy. (Congress St.), Cook Co., from Kenny Constr. Co., 111 W. Washington St., Zone 2, **$320,833.** Dpt. Subways & Superhighways, 20 N. Wacker St., Zone 6. Virgil E. Gunlock, dir., engr. CD 9/23.

Massachusetts—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston, Oct. 11, repairs, alterations to Hollston St. Bridge over Nashua River, Fitchburg, from G. Bonazoli & Sons, Hudson, **$86,180.** CD 9/28.

CONTRACTS AWARDED

Massachusetts — Commonwealth of Mass., Metropolitan Dist. Comn., 20 Somerset St., Eliot St., Eliot Bridge, Gerry's Landing Causeway, and Boston-Cambridge-Longfellow Bridge, 2-2 N. Washington St., North Attleboro, **$732,089.** Bids 10/6, awarded 10/7. CD 10/12, under LB.

New York—State Dpt. P. Wks., Albany, 2 grade separation structures to carry Geneva St., Village of Lyons, over tracks of West Shore R. R. and N. Y. C. R. R., Wayne Co., to Lane Constr. Corp., 37 County St., Meriden, Conn., **$808,303.** Bids 8/24. CD 8/29, under LB.

● Pennsylvania—State Hy. Dpt., Harrisburg, steel deck truss bridge, 1,013 ft. L. R. 763 (2A), T. R. U. S. 22 and 30, Frazer St., Penn Lincoln Parkway, Allegheny Co., to R. Perini & Sons, Inc., Framingham, Mass., **$1,847,361.** Bids 9/30, awarded 10/14. CD 10/4, under LB.

Pa., Harrisburg—Peoples Bridge Co., 112 E. 19 St., New York 3, N. Y., steel deck replacing wooden deck on Walnut Street Bridge across Susquehanna River between Harrisburg and Wormleysburg, to Whiting Turner Constr. Co., Natl. Marine Bank Bldg., Baltimore, Md. Approx. **$350,000.** CD 10/21/48.

Utah, Salt Lake City—City, c/o Irma Bitner, recdr., City and County Bldg., rein.-con. bridge across Jordan River at 3rd South St., to Gibbons & Reed, 259 W. 3rd South St., **$68,413.** Bids 9/20. CD 9/21, under LB.

Virginia—Richmond, Fredericksburg & Potomac R. R. Co., E. Hastings, ch. engr., Broad St. Station, Richmond, 750 ft. concrete culvert, near Pentagon Bldg., Arlington Co., to Hughes Keegan, Inc., 1726 Altamont St., Richmond, **$100,000.**

Wyoming—State Hy. Comn., Cheyenne, overhead crossing, consisting four I-beam spans over Union Pacific R. R. tracks near Como, grading, draining approaches 0.322 mi. Rawkins Medicine Rd., Carbon Co., to Charles M. Smith, Thermopolis, **$197,202.** Est. $150,056. Bids 9/39.

STREETS AND ROADS

BIDS ASKED

November 7

La., New Iberia—City, c/o Mayor, Prof. S.W. 51, 19,665 sq. yd. concrete sidewalks. CD 4/19.

November 10

Calif., Agnew—State Div. Architecture, P. Wks. Bldg., Sacramento, grading, paving, drainage, etc. at Agnews State Hospital, Anson Boyd, Sacramento, state archt.

Calif., Ukiah—State Div. Architecture, P. Wks. Bldg., Sacramento, grading, paving at 12th Agricultural Assn. Dist., Anson Boyd, Sacramento, state archt.

SOON LETS CONTRACT

Tex., Houston—J. Beady Smallwood, Citizens State Bank Bldg., soon lets contract street constr. and asph. paving, for 1100 homesite units, $80,000. E. S. & Robert M. Atkinson, 745 First Natl. Bank Bldg., engrs. CD 10/3.

LOW BIDDERS

†Colorado—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Oct. 11, reconstructing State Hy. U. S. 34 completing access road to Granby Pumping Plant, Grand Co., Spec. 2795, from Colorado Constructors, Inc., 725 W. 39 Ave., Denver, **$156,294.** Est. $154,440. CD 9/21.

Florida—State Hy. Dpt., Ocala, Municipal Auditorium, Ocala, miami rock base with bit 4.258 mi. Rd. 717 between Bacon Point and point in Pahokee, State Proj. Job. 9 75-111, Palm Beach Co., from Reynolds & Smith, Lake Placid, **$237,488*****b. conc. 2.72 mi. Rd. 5 between Rd. 15 at Bay St., Jacksonville and 37 St. State Proj. Job. No. 7205-109, and b. conc bit. Rd. 5, sections between Rd. No. A1A and S. Main St. State Proj. Job. No. 7207-110, Duval Co., from Duval Eng. & Constr. Co., 1746 E. Adams St., Jacksonville, **$63,802*****b. conc. 12.488 mi. Rd. 55 between Chiefland and point approx. 12.488 mi. southeast Levy Co., from Macasphalt Corp., Lakeland, **$111,781*****bit. 15.713 mi. Rd. 80, between Tice and Hendry Co. line, State Proj. Job. 1202-905, Lee Co., from J. D. Manly Constr. Co., Leesburg, **$51,833.** CD 9/23.

Louisiana—State Hy. Dpt., Baton Rouge, Oct. 5, b. conc. 1.833 mi., three 19 ft. span bridge, Harahan-Airline Hy., State Rte. C-1671, S. P. 826-44-02, Jefferson Parish, from E. A. Caldwell, Box 1327, Baton Rouge, **$77,-902*****bit. 8.673 mi., seven 20 ft. concrete slab bridge, Eunice-Point Blue Hy., State Rte. 119, S.P. 203-02-04, Evangeline Parish, from T. L. James & Co., Inc., Ruston, **$65,184.** CD 9/9***bit. 4.374 mi. Ville Platte Tate Cove, H., State Rte. 570, S.P. 372-01-04, Evangeline Parish, from W. H. Patterson & Co., Box 2229, Baton Rouge, **$178,416*****bit. 3.7 mi. Lutcher Rd. and Lutcher Cutoff Highways, State Rte. C 1986 and 2.3 S.P. 256-12-05 and 847-02-03, St. James Parish, from Barber Brothers Co., Box 629, Baton Rouge, **$58,467.** CD 9/22.

Maryland—State Rds. Comn., Baltimore, grading, drainage, surf. 4.02 mi. relocation Rte. 312 between Ingleside and Barclay, Contr. Q-228-1-215, Queen Anne Co., from Eastern Highways, Belle Grove Rd., Baltimore, **$246,-235.** CD 10/6.

New Jersey—State Hy. Dpt., Trenton, Oct. 3, pavement sub-sealing and repairs 1.52 mi. Rte. 29, Sects. 7D and 8 S from Chimney Rock to Mountain Ave., Bridgewater Twp. and Round Brook Boro, Fed. Proj. EI-178 (8), Somerset Co., from Union Building & Constr. Corp., 631 Main St., Passaic, **$140,952.** CD 9/22.

†New Mexico—Bureau Public Roads, General Services Admin., 254 New Customhouse, Denver, Colo., Oct. 12, 2.076 mi. Datil Reserve-Dry Creek, Nav. Mexico Fed. Proj. 21-N and O, from N. J. Skousen, Albuquerque, **$398,195.** CD 9/29.

CONTRACTS AWARDED

California—State Div. Hys., Sacramento, c. conc. on cement treated sub-grade with plant mix on existing pavement, cement stabilized base material 2.5 mi. to provide 4 lane divided hy. between 0.2 mi. east of Ventura Co. line and 0.2 mi. east of Carpenteria, Ventura and Santa Barbara Counties, to Granite Constr. Co., Box 900, Watsonville, **$661,807.** Bids 10/5. CD 10/11, under LB.

Kan., Kansas City—City, constructing Park Dr., to J. A. Tobon Constr. Co., 3700 Rainbow Blvd., **$158,327.** Bids 10/4. J. O. Armstrong, city engr.

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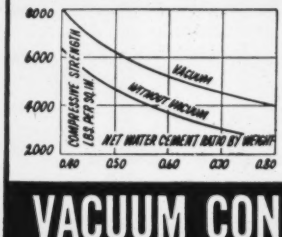

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La., New Orleans—City Purch. Div., 302 City Hall, street projects, incl. Proposal Numbers 11,873, 11,874, 11,876, 11,879, and 11,884, to Boh Brothers Constr. Co., 2400 Cypress St., **$297,338*****asph. resurf. Proposal Numbers 11,870, 11,871, 11,872, 11,889, 11,890, and 11,892, to Texas Bithulithic Co., Burma Rd., **$145,452*****street surf. to Lang Co., 2500 Poydras St., **$56,188*****subsurface drainage Proposal Numbers 11,875, 11,877, and 11,882, to A. N. Goldberg, Inc., Maison Blanche Bldg., **$80,645.** Grand total $579,620. Bids 10/5, awarded 10/7.

Maine—State Hy. Dpt., Augusta, b. conc. or bit. macadam surf. 7.27 mi. F. A. P. DI 45 (2), Winn and FI 297 (7), Mattawamkeag, to J. R. Cianchette, Pittsfield, **$454,263.** Bids 10/12. CD 9/30.

Okla., Enid—City, City Hall, resurf. 66 residence blocks to Metropolitan Paving Co., 1600 W. Reno St., Oklahoma City, Zone 4, **$220,735.** Est. $225,000. Bids 9/12, awarded 10/4. V. G. Thompson, 1100 W. Main St., Oklahoma City, Zone 4, engr.

●**Pennsylvania**—State Hy. Dpt., Harrisburg, divided hy. consisting of c. conc. westbound variable 36 to 44 ft. wide, eastbound with 4 ft. divisor area, incl. 1 rigid frame c. conc. hy. underpass bridge, grading, drainage, 2,993 ft. L. R. 763, (2B), T. R. U. S. 22 and 30, Bates St. Interchange Penn Lincoln Parkway, Allegheny Co., to R. Perini & Sons., Inc., 73 Montwait Ave., Framingham, Mass., **$2,070,570** ***constructing divided hy. incl. crushed aggregate base with bit. c. conc. pavement concrete divisor incl. 1-beam hy. overhead bridge, one 1-beam bridge for construction northbound and southbound connection ramps, one 1-beam bridge and one rein.-con. arch 5,690 ft. L. R. 247 (6), T. R. 88, Saw Mill Run Blvd., Allegheny Co., to Harrison Constr. Co., 1101 Western Ave., Pittsburgh, Zone 12, **$2,942,988.** Bids 9/30, awarded 10/14. CD 10/4, under LB.

Tex., Fort Worth—Tarrant Co., Courthouse, Precinct 1, road constr., drainage, **$110,000;** Precinct 2, road reconstr. and bridge, **$125,000;** Precinct 3, grading, drainage and bridge, **$90,000;** Precinct 4, road reconstr. and bridge, **$100,000,** force account. Grand total $425,000. CD 8/16.

†**Utah**—Pub. Roads Admin., General Services Admin., 473 Federal Bldg., Ogden, road mixed bit. surf. 7.83 mi. Forest Hy., in Fishlake National Forest, between Sevier and Cove Fort, Utah Forest Hy. Proj. 12-A5, B4, Millard and Sevier Counties, to Floyd S. Whiting, Murray, **$226,640.** Bids 9/22.

Wash., Seattle—City County-City Bldg., Seattle, Zone 4, paving alleys in Block 25, second plot of West Seattle between 39 and 47 Aves. S.W., to Northwest Constr. Co., 3960 6 Ave. N.W. **$103,434.** Est. $118,630. Bids 10/13. CD 10/6.

Wyoming—State Hy. Comn., Cheyenne, base course surf. 9.364 mi. Green River-Linwood Rd., Sweetwater Co., to J. J. Dooling, 5015 E. 17 Ave., Denver, Colo., **$124,850** est. $150,842 ***base course surf., oil treatment by road mix method, stone chip seal coat, one 3 continuous I-beam span bridge 1.599 mi. Deaver-Cowley Rd., Big Horn Co., to W. E. Barling, Inc., Meeteese, **$101,139,** est. $108,692***selected material surf., 8 rein.-con. culverts one I-beam bridge, over Beaver Creek 12.413 mi. Newcastle-Lusk Rd., Weston Co., to S. Birch & Sons Co., Ford Bldg., Great Falls, Mont., **$362,617** est. $439,670. Grand total $588,635. Bids 3/30.

EARTHWORK, WATERWAYS

BIDS ASKED

November 1

†**Illinois**—U .S. Eng., 826 U. S. Court House and Custom House, St. Louis, 1, Mo., floodwalls and closure structures, Wood River Drainage and Levee Dist., (Proj. Item I-H) Madison Co., Serial No. CIVENG 23-065-50-23.

†**Missouri**—U. S. Eng., P. O. Box 97, Memphis, Tenn., approx. 290,000 cu. yd. levee work and clearing approx. 167 stations of existing ditch, Fisk to Fagus, CIVENG 40-041-50-54.

†**Pennsylvania**—U. S. Eng., 925 New Federal Bldg., Pittsburgh, tainter gate operating machinery, Morgantown Lock and Dam, Serial No. CIVENG-36-058-50-44.

November 2

†**Arkansas**—U. S. Eng., 300 Broadway, Little Rock, emergency levee repairs 58,000 cu. yd. set-back levee on right bank Arkansas River, Morrilton, Conway Co., Inv. CIVENG 03-050-50-35.

†**Mississippi** — U. S. Eng., P. O. Box 60, Vicksburg, approx. 26,600 cu. yd. earthwork, east bank Mississippi River, Serial No. CIVENG 22-052-50-57.

November 3

†**Arkansas**—U. S. Eng., 300 Broadway, Little Rock, 620,000 cu. yd. levee and one 24 in. C.M.P. culvert on left bank Arkansas River, Conway Co., Inv. CIVENG 03-050-50-30.

November 4

†**Arkansas**—U. S. Eng., 300 Broadway, Little Rock, emergency levee repairs, Perry County Levee Dist. 1, 25,000 cu. yd. set-back levee and one triple 48 inch C.M.P. culvert on right bank Arkansas River, Perryville, Perry Co., Inv. No. CIVENG-03-050-50-36.

†**South Carolina**—U. S. Eng., Customhouse, Charleston, removing, disposing all material lying above the plane of 12 ft. below local mean low water at 3 shoaled reaches in the

section of the Atlantic Intracoastal Waterway from Charleston to Beaufort, Shoal No. 1, the most northerly shoal in Stono River, vicinity of S. C. Hy. Bridge 610; Shoal 3, southerly shoal, at intersection of Fenwick Cut and South Edisto River, Serial No. CIVENG-38-081-50-8.

November 8

†Montana — U. S. Eng., Fort Peck, open shelter bldg., and other public use facilities at Devil's Creek Site, Fort Peck Reservoir, Serial No. CIVENG-24-016-50-13.

†Montana — U. S. Eng., Fort Peck, open shelter building and other public use facilities at Bear Creek Site, Fort Peck Reservoir, Serial No. CIVENG-24-016-50-12.

†New Mexico—Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Fort Sumner, one vertical shaft single stage, mixed flow or propeller-type pump with capacity of 20 cu. ft. per second under total head of 21.3 ft., and one 70 hp. vertical shaft, propeller-type hydraulic turbine with V-belt drive connection to above pump, etc., Fort Sumner Pumping Plant, Fort Sumner Proj., Spec. 2812. L. N. McClellan, ch. engr.

SOON LETS CONTRACT

Tex., Houston—J. Deady Smallwood, Citizens State Bank Bldg., Houston, soon lets contract drainage, site development (for 1,100 unit homesites area), $45,000. E. S. & Rob. M. Atkinson, 745 First Natl. Bank Bldg., Houston, engr. CD 10/3.

LOW BIDDERS

†Colorado—U. S. Eng., P. O. Box 1538, Albuquerque, N. M., cancelled bids to have been opened Nov. 7, embankment erosion control, Templeton Gap Floodway, Colorado Springs, CIVENG-29-005-50-4, CD 10/11.

†Louisiana—U. S. Eng., foot Prytania St., New Orleans, Oct. 12, approx. 174,000 cu. yd. semi-compacted levee embankment, South Bank Red River Levees, Rapides Parish. Serial No. CIVENG 16-047-50-81, from Blanks Constr. Co., P. O. Box 37, Vidalia, Approx. $258,874. Est. $90,000. CD 10/5.

†Oregon — Bureau Reclamation, Dpt. Interior, Bend, Ore., Oct. 11, Northwest Unit pipeline Grants Pass Irrigation District, Deschutes Proj., Josephine Co., Spec. RL-55, from P. S. Lord, 4507 S.E. Milwaukee, Portland, $112,530. Est. $81,700. CD 9/22.

†Pennsylvania—U. S. Eng., P. O. Box 1715, Baltimore 3, Md., rejected bids Sept. 23, replacing channel wall, Codorus Creek, York, CIVENG-18-020-50-4. CD 8/29.

†Washington—Bureau Reclamation, Dpt. Interior, Coulee Dam, Oct. 11, earthwork Station 7 plus 20 to Station 66 plus 40:57, Potholes East Canal, Columbia Basin Proj., 5 to 11 mi. north of Othelo, Spec. 2787, from Guy F. Atkinson Co., Cascade Bldg., Portland, Ore., $937,602. CD 9/19.

CONTRACTS AWARDED

●†Maryland and West Virginia—U. S. Eng., 1st and Douglas Sts., N. W. Wash., 25, D. C., conduits (pressure) and sewers, Group No. 2, Local Flood Protection Proj., Serial No. CIVENG-49-080-50-15, to George & Lynch, Inc., Delaware Trust Bldg., Wilmington, Del., $1,734,000. Bids 10/6, under LB.

Mont., Billings—Billings Bench Water Assn., compact canal fill and structures, to Long Constr. Co., Billings, $72,132. Bids 10/4.

●Tex., Houston—Consolidated Western Steel Corp., c/o U. S. Steel Corp., 2087 E. Slauson St., Los Angeles, Calif., drainage, concrete fdns., dirt work, site preparation, own forces. Approx $1,000,000. CD 10/12, under Industrial Buildings.

N. S. Clarke's Harbour — Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., dredging, to Diamond Constr. Co., Ltd., 60 Carleton St., Fredericton, N. B., Approx $48,168. Bids 9/7. CD 9/2.

AIRPORTS AND AIRBASES

LOW BIDDERS

Calif., Los Angeles—RUNWAY LIGHTS—City, City Hall, rejected bids Sept. 13, installing high intensity runway lights at Los Angeles Airport, L. B. Alt. A, $16,138; Alt. A-1, $33,712; 1-B, $65,866; B-1, $48,059. Est. approx. $50,000. CD 9/20, under LB.

●La., Shreveport—AIRPORT—City, City Hall, Oct. 13, municipal airport, clearing and grading from M. R. Thomason, Box 1847, Montgomery, Ala., $662,046, paving runways, from City Constr. Co., 2411 Inwood Rd., Dallas, Tex., $1,196,495. CD 9/23.

CONTRACTS AWARDED

Calif., Los Angeles—RUNWAY, etc.—City, City Hall exten. Runway D and Taxiways J and M, Los Angeles Airport, to S. Edmonson & Sons, 2501 E. 52 St., Vernon, $99,886. Awarded 10/5. CD 5/16/45.

Pa., Phila.—RESURFACING—Phila. Dpt. P. Wks., City Hall Annex, resurf. Runway 4, Philadelphia International Airport, to Harry C. Erb, Schaff Bldg., $55,125. A. Zane Hoffman, ch. engr. Bids 9/30. CD 9/22.

†Alaska, Fairbanks — AIRCRAFT SHOP — U. S. Eng., Anchorage aircraft shop building at Ladd Air Force Base, to Gaasland Constr. Co., Bellingham, Wash., $262,660. Est. $280,061. Bids 10/11.

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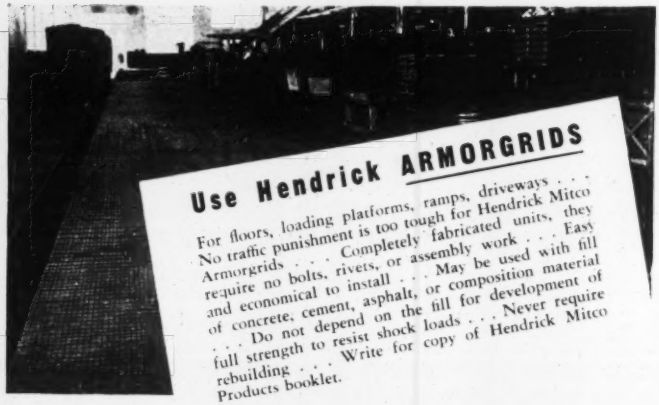

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PUBLIC BUILDINGS

BIDS ASKED

November 10

†**Arizona and Nevada**—RESIDENCES—Bureau Reclamation, Dpt. Interior, Boulder City, Nev., residences for Boulder City, Nev., Spec. R3-B-9 (Region 3), Boulder Canyon Proj. L. N. McClellan, Bldg. 1-A, Denver Federal Center, Denver, Colo., ch. engr.

Calif., Camarillo—HOSPITAL GROUND IMPRVS.—State Div. Architecture, P. Wks. Bldg., Sacramento, ground imprvs. at Camarillo State Hospital. Anson Boyd, Sacramento, state archt. CD 3/5/45.

†**Calif., Inyokern**—LABORATORY—U. S. Navy, Inyokern, aerodynamics field laboratory, 41x482 ft. main bldg. and 21x67 ft. control bldg. Approx. $68,000. CD 7/23/48.

Calif., Ontario—ARMORY—State Div. Architecture, P. Wks. Bldg., Sacramento, 80x140 ft. rein.-con. armory. Plans deposit $25. Anson Boyd, Sacramento, state archt.

†**Montana**—POWER CABLES, etc.—U. S. Eng., Fort Peck, furnishing, installing power, light and communication cables, water level recording sys., gate position indicator sys. and air compressor in shaft and power house areas at Fort Peck. Serial No. CIVENG—24-016-50-16. Extended date. CD 9/28.

LOW BIDDERS

Calif., Los Angeles—ENGINEERING—Bd. Regents University of California, 405 Hilgard Ave., Oct. 13. Unit B, Engineering Bldg., from Robert E. McKee, 4700 San Fernando Rd., Los Angeles **$719,900.** CD 10/4.

Conn., Bristol — HOUSING — City Fred O. Zuroff, chn. Bristol Housing Auth., Oct. 10. 40 duplex frame 80 family units, from DeFonce Constr. Co., 110 Colonial Ave., Bridgeport, **$874,800.** CD 9/30.

●**Ill., Chicago**—HOUSING — Chicago Housing Auth., 343 S. Dearborn St., Chicago, Oct. 11, 121 dwelling units, incl. twenty-seven 2 story brick row houses, Site 1, 108 and Racine Sts., from Jacobson Bros. Co., 20 N. Wacker Dr., **$1,429,000.** CD 9/14.

●**N. Y., Brooklyn** — SCHOOL — Supt. School Buildings, Design & Constr., 49 Flatbush Ave. exter., Zone 1, Oct. 11, general contract, P. S. 249, Caton Ave., Marlborough and Rugby Rds., from Laurence J. Rice, Inc., 30 Deepdown Rd., Forest Hills, **$1,129,000.** CD 9/19.

N. Y., Wassaic—INFIRMARY—Bureau Contracts & Accounts, Albany, Oct. 13, Infirmary Bldgs. 54 and 55, from Walter A. Stanley Constr. Co., Railroad Ave., Ossining, **$577,000.**

N. C., Chapel Hill—BUILDING—University of North Carolina, Chapel Hill, Oct. 6, Manning Hall addn. (Law School) from King-Hunter, Inc., Greensboro, **$268,222.** F. Raymond Weeks, Inc., Durham, archt. Wiley & Wilson, Lynchburg, Va., consult. engrs.

†**North Dakota**—RESIDENCE—Bureau Reclamation, Dpt. Interior, Glen Ullin, rejected bids Sept. 28, 5 room caretaker's residence for Heart Butte Dam, Glen Ullin. Spec. R6-33 (Region 6), Missouri River Basin Proj. Will re-advertise.

●†**Tex., Fort Sam Houston (San Antonio** — HOUSING — U. S. Eng., Fort Sam Houston, cancelled bids to have been opened Oct. 10 500 rental housing units for Jr. Grade Officers and noncommissioned personnel. Approx. **$3,000,000.** CD 10/3.

Tex., Iraan and Sheffield — SCHOOLS — Sheffield Independent School Dist., Sheffield, rejected bids Oct. 5, masonry schools in towns of Iraan and Sheffield, concrete slab fdns. L. B. **$599,500.** CD 10/12, under LB.

Va., Charlottesville—NURSES HOME—State of Virginia, Richmond, Oct. 14, nurses home at Blue Ridge Sanatorium, Div. A, from Dye Constr. Co., Charlottesville, **$239,955;** Divs. A and E, from John W. Daniel & Co., Danville, **$249,363** and **$320,356** respectively. Stanack & Scribner, 712 Lyons Court Lane, archts. CD 3/31/48.

Wis., Milwaukee—CELL HOUSE—Milwaukee Co., Courthouse, rejected bids Sept. 9, 4 story, bsmt., 176x396 ft. cell house, in Franklin, L. B. **$892,743.** Will re-advertise. CD 9/16, under LB.

Ont., Toronto — SCHOOL — Bd. Educ., 155 College St., Dufferin School addn., Berkeley St., from Fried Constr. Co., Ltd., 70 Victoria St., Approx. **$547,655.** C. E. C. Dyson, c/o owner, archt. CD 9/15.

CONTRACTS AWARDED

Calif., Oakland—SCHOOL—Oakland Bd. Educ., 1025 2 Ave., Belle Vista School, to Carl E. Swenson Co., Box 558, San Jose, **$538,213.** Bids 9/27. CD 10/4, under LB.

La., Oak Grove — SCHOOL — West Carroll Parish School Bd., Oak Grove, elementary school, high school and trade school bldg. and home economics cottage, to Garland Constr. Co., Rayville, **$477,850.** Bids 10/13. CD 9/27.

Mass., Chelsea—LAUNDRY—Commonwealth of Mass., Finance & Ad Dpt., State House, Boston, Contr. 1 V-101, brick, steel laundry addn., Soldiers Home, Crest Ave., to Columbia Constr. Co., 18 Tremont St., Boston, **$104,427.** Perry Shaw & Hepburn, 31 St. James Ave., Boston, archts.

Mass., Westfield — HOUSING — City of Westfield Housing Auth., veterans housing Proj. 200-1, Southhampton Rd., College Hy.,

to Kay Constr. Co., Clover St., Windsor, Conn. **$616,824.** Bids 9/29, awarded 10/10. CD 10/11, under LB.

N. M., Santa Fe — OFFICE — State, State Capitol Bldg., 1 and 2 story, 120x252 ft. state office, to Lembke Constr. Co., P. O. Box 144, Albuquerque, **$777,209.** Bids 10/6, awarded 10/9. CD 10/12, under LB.

●**N. Y., Forest Hills**—SCHOOL—Supt. School Buildings, Design & Constr., 49 Flatbush Ave. exten., Brooklyn, Zone 1, general contract P. S. 165, 150 St. between 70 Rd. and 71 Ave., to Colmar Constr. Co., **364** Gold St., Brooklyn, Zone 1, **$1,187,200.** Bids 9/14. CD 9/16, under LB.

COMMERCIAL BUILDINGS

BIDS ASKED

October 31

Ont., Welland—SCHOOL—A. B. Scott, archt., 112 Division St., classroom and 8 other rooms brick school, concrete fdns., for School Sisters of Notre Dame, Welland, Approx. $275,000. Plans deposit $25.

November 2

Tex., Wichita Falls—CHURCH—Lamar Ave. Baptist Congregation, Wichita Falls, 3 story, steel church, concrete pier and beam fdn., 11 and Harrison Sts., $300,000. Jesse G. Dixon, 13-B Indiana Ave., archt. CD 5/22/47.

November 3

Md., Baltimore — MEMORIAL CHAPEL — Loyola College, Evergreen St., 2 story Gothic stone, limestone memorial chapel, seating capacity 650, 5 marble altars, 36 stained glass windows, S.W. corner of Campus, Charles St. and Cold Spring Lane, Approx. $600,000. Gaudreau & Gaudreau, 527 N. Charles St., archts., Egli & Gompf, Inc., 425 St. Paul Pl., mech. engr. Faisant & Kooken, 2017 Maryland Ave., structural engrs. CD 2/19/47.

SOON LETS CONTRACT

Calif., Los Angeles—OFFICE—Los Angeles Jewish Community Center, 590 N. Vermont Ave., soon lets contract 5 story 100,000 sq. ft. office, $1,000,000. Extended date. Albert Criz, 556 S. Harvard St., archt. CD 9/27.

Conn., Manchester—HOSPITAL—Manchester Memorial Hospital, Raymond Goslee, chn. Bldg. Comn., 71 Haynes St., soon lets contract 3 story, bsmnt., west wing hospital unit addn., incl. 44 addnl. beds, kitchen, laboratory, cafeteria and X-ray, Hynes St., $750,000. Ebbets, Frid & Prentice, 862 Asylum Ave., Hartford, archts. CD 12/29/48.

Mass., Newton—DORMITORY—Lasell Junior College, 117 Woodland Rd., soon lets contract 4 story, bsmnt. dormitory unit, Woodland Rd., Newton (Auburndale), Approx. $250,000. J. Williams Beal Sons, 185 Devonshire St., Boston, archts. Mark Linenthal, 16 Lincoln St., Boston, structural engr.

Minn., St. Paul—SCHOOL, etc.—Maternity of the Blessed Virgin Parish, c/o Rev. J. O'Connell, Dale St. and Arlington Ave., soon lets contract superstructure for 2 story bsmnt. school, church and rectory. $500,000. B. J. Knowles & Co., 504 Commerce Bldg., archts CD 2/6.

Tex., Vernon—OFFICE, etc.—W. T. Waggoner Estate, c/o B. R. Anderson, Vernon, soon lets contract 2 and 3 story, 200x240 ft. office, garage and warehouse, concrete pier and beam fdn., air-conditioning, etc. $250,000. Wilson & Patterson, 209 Majestic Bldg., Fort Worth, archts. Yandell, Cowan & Love, 415 Dansiger Bldg., Fort Worth, engrs. CD 6/3.

Wis., Burlington — HOSPITAL — Memorial Hospital Assn., Burlington, soon lets contract two 2 story, bsmnt., 43x61 ft. hospital wings. Extended date. G. J. DeGolleke, 152 W. Wisconsin Ave., Milwaukee, Zone 3, archt. CD 9/9.

LOW BIDDERS

Minn., Duluth—CHURCH, etc.—First Lutheran Church, 315 North 1st Ave. East, rejected bids Oct. 4, 2 story bsmnt., 132x136 ft. church and school, 11 Ave. East and Superior Sts. and London Rd. **$450,000.** New bid date Oct. 17. CD 9/29.

Pa., Erie—SCHOOL—St. John the Baptist Roman Catholic Congregation, Erie, Oct. 4, L shaped 85x244 ft. and 63x125 ft., rein.-con., brick main bldg., gymnasium, from Sessinghaus & Ostergaard, Inc., 130 W. 11 St., **$486,000.** CD 9/29.

●**Wyo., Cheyenne** — HOSPITAL — Sisters of Charity of Leavenworth, Xavier, Kan., Oct. 6, 4 story, 75x200 ft. hospital with 3 wings, from Olson Constr. Co., 1549 S. 2 St. West, Salt Lake City, Utah, **$1,128,900.** CD 9/13.

CONTRACTS AWARDED

●**Calif., Los Angeles**—APARTMENT PROJECT—Gloria Homes, c/o contractor, 423 apartment units, to Baruch Corp., 5655 Wilshire Blvd., Approx. **$4,000,000.** M. H. Fleishmann, 8844 W. Olympic Blvd., Beverly Hills, archt.

Calif., San Francisco—OFFICE—California Packing Corp., 101 California St., altering office, Fremont and Howard Sts., to Swinerton & Walberg, 225 Bush St. Approx. **$800,000.** Albert F. Roller, Crocker 1 Natl. Bank Bldg., archt.

Ill., Westchester — HOUSING — George F. Nixon, 33 N. LaSalle St., Zone 33, Chicago, 50 ranch type frame, brick, houses, Bellevue Ave. between Canterbury and Balmoral Sts. Owner builds. Approx. **$700,000.** Carl J. Kastrup, 7346 Madison St., Forest Park, archts.

Ill., Wilmette—TEMPLE—Bahai National Center, Sheridan Rd. at Linden, Allen B. McDaniel, secy., Temple of Worship, to Geo. A. Fuller & Co., 111 W. Washington St.,

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Chicago, Zone 2, **$600,000.** Shaw Metz & Dolio, 208 S. La Salle St., Chicago, Zone 4, archts.

Ia., Des Moines—HOSPITAL—Iowa Methodist Hospital, 1200 Pleasant St., general contract hospital addn., to A. H. Neumann & Bros., 514 Hubbel Bldg., **$922,049.** CD 8/30, under LB.

●Ia., Des Moines — APARTMENTS — Rosoff Bros., 292 Madison Ave., New York, N. Y., Franklin Court Apartments, 49 and Franklin Sts. Owner builds, **$1,437,300.** Edwards & Green, Broadway and Carman Sts., Camden, N. J., archts. CD 1/26.

La., New Orleans—HOUSES—Orleander Development Co., c/o contractor, 75 houses, to Globe Constr. Co., 8139 Oleander St. Approx. **$750,000.**

●Md., Baltimore—APARTMENTS—Rodgers Apts. No. 1, Loch Raven Village, Towson, 18 brick, block apartments, near here, to Rodgers Forge Constr. Co., Loch Raven Blvd., Towson. **$1,092,000.** James R. Cox, York Rd., Towson, archt.

●Md., Silver Springs—STORES, etc.—Little Tavern Shops, Inc., Harry F. Duncan, pres., 1007 Ripley St., 1 and 2 story, 200x250 ft., rein.-con., cinder block stores, bowling alleys, 8200 Block Georgia Ave., to Davis & Platt, Inc., 401 Butternut St. N.W., Wash., D. C., **$2,000,000.** George H. Boyer, c/o owner, archt.

●N. J., Barrington—APARTMENT DEVELOPMENT—Barrington Manor Apartments Inc., c/o Edward A. L. Cox, archt., 709 Market St., Camden, apartment development, Kent Ave., separate contracts, **$2,500,000.**

N. J., Trenton—STORE—Swern & Co., Broad and Front Sts., store addns., alteration, to Rothschild Constr. Co., 2232 N. Carlisle St., Phila., Pa., **$400,000.** Louis S. Kaplan, 25 N. Montgomery Ave., archt. CD 9/11/46.

N. Y., New York—BUILDINGS, etc.—Home and Hospital of Daughters of Jacob, 167 St. and Findlay Ave., revised plans two 6 story bldgs. and shop and storage bldg., to H. R. H. Constr. Co., 16 W. 46 St., **$700,000.** CD 7/19, under LB.

O., Cleveland—HOUSING—Malvin Helf, Citizens Bldg., fifty-eight 1 story, frame houses, Groton, Grenvale and Malden Rds., separate contracts. **$580,000.**

O., Euclid—HOUSING—Sam Feiner, Inc., 2425 Canterbury St., sixty-eight 1½ story, bsmnt. houses, E. 255 St., separate contracts. **$680,000.**

●O., Parma—HOUSING—Barsan Schoenberger Realty & Investment Co., 576 & Ridge Rd., two hundred 1½ story, bsmnt., brick houses, Arden, Snow, Bremen and State Sts., etc., separate contracts. **$1,900,000.**

●O., Shaker Heights—APARTMENT—Vogue Investment Co., Society for Savings Bank, 127 Public Sq., Cleveland, four 3 story bsmnt., brick apartments, incl. 108 suites, underground garage, to Franz Stein & Sons, 812 Society for Savings Bank, 127 Public Sq., Cleveland. Approx. **$1,850,000.**

O., Youngstown—SHOPPING CENTER—Edward M. DeBartolo, pres. Belmont Shopping Center, Inc., Youngstown, shopping center, parking area, Belmont Ave. between Catalina and Francisca Aves., to M. DeBartolo Constr. Co., 216 Alexander Ave. Approx. **$500,000.**

Pa., Phila.—HOUSING—J. B. S. Anderson, 1439 S. Penn. Sq., residential development, separate contracts, **$114,000.** Christian H. Fries, 3701 N. Broad St., archt.

Pa., Phila.—HOUSING—Broadlawn Homes Co., 731 Valley Rd., residential development, Revere St., etc., Melrose Park, separate contracts, **$800,000.** Henry S. Berg, 1411 Walnut St., archt.

●Tenn., Nashville—HOUSING UNITS—Guaranty Mortgage Co., c/o contractor, 600 housing units at Smyrna Air Base, to Oman Constr. Co., Acklen Park. Approx. **$5,000,000.** CD 6/17.

Tex., Beaumont—APARTMENT—Hollywood Village Corp., c/o Robert W. Clemens, pres., 4110 Bennis St., Houston, 60 apartment units for 15 bldgs., adjacent to 11 St., own forces. Approx. **$300,000.** CD 10/6.

Tex., Beaumont—SHOPPING CENTER—M. L. Leffer Jr. & Assoc., Beaumont, shopping center, laundry plant, asph. area paving, to Holliday Constr. Co., 2990 Crockett St., **$285,000.** CD 10/5.

Tex., Fort Worth — DWELLINGS — Oscar Seward, III, Flatiron Bldg., 200 dwellings. Owner builds. **$650,000.** CD 7/8/48.

Tex., Houston—HOUSING—S. E. Babbitt & W. E. Krumnow and Akard Bell, 6625 St. Augustine St., 40 housing units, concrete slab fdn. Owner builds. Approx. **$250,000.** CD 9/30.

Tex., Houston—HOUSING—Draper Constr. Co., Kress Bldg., housing. Owner builds. Approx. **$250,000.** CD 10/4.

Tex., Houston—DWELLINGS—R. C. Heiner, 7443 Park Place Blvd., 25 dwellings addnl. in Sect. 4, Santa Rosa addn. Owner builds. Approx. **$268,750.** CD 10/4.

Tex., Houston—DWELLINGS—E. F. Stoerner & Co. Inc., 5315 Carrollton St., 20 dwellings, own forces. Approx. **$250,000.** CD 9/30.

Wis., Menasha — CONVENT — St. Mary's Catholic Congregation, Menasha, 2½ story, L-shaped 74x104 ft., convent, to Charles Gomsky Co., 409 Garfield Ave. E. A. Wettengel, 116 S. Pierce St., Appleton, archt.

Wis., Racine—CHURCH—First Evangelical Congregation, Racine, church, day labor. **$300,000.** H. C. Haeuser, 2051 W. Wisconsin Ave., Zone 3, Milwaukee, archt.

B. C., Vancouver—OFFICE, etc.—MacKenzie, White & Dunsmuir Ltd., 625 Buuard St., 1 story, 120x280 ft., rein.-con. office and warehouse, to B. C. Bridge & Dredging Co. Ltd., 544 Howe St., **$300,000.** Awarded 10/12.

B. C., Vancouver—OFFICE—Yorkshire & Pacific Securities Ltd., 525 Seymour St., 5 story, full bsmnt., 52x120 ft., rein.-con office, to Commonwealth Constr. Co., Ltd., 670 Taylor St., **$402,500.** Bids 9/13, awarded 10/12. CD 9/6.

Que., Baie St. Paul—SCHOOL—Reverend Sisters of Congregation of Notre Dame, 3040 W. Sherbrooke W., Montreal, concrete, brick school, to Ernestte Ltd., 75 St. Laurent St., Quebec City, **$300,000.** S. Brassard, 39 Moncton Ave., Quebec City, archt. CD 8/25.

●Que., Montreal—HOUSING—Grenon Constr. Co., Ltd., 5760 Park Ave., 100 duplexes, own forces. Approx. **$1,500,000.** P. Paquette, 5468 Park Ave., archt.

INDUSTRIAL BUILDINGS

BIDS ASKED

Conn., Waterbury—WAREHOUSE—Chatfield & Chatfield, 94 Benedict St., (selected list bidders) 2 story, 30x45 ft. and 35x60 ft. brick, concrete warehouse addn., Benedict St. **$68,000.** Albert B. Fucito & Sons, 143 S. Elm St., archts.

Pa., Morrisville — PACKING HOUSE — Warner Co., 219 N. Broad St., Phila., (selected list bidders,) packing house. Approx **$68,000.**

Pa., Upland — FACTORY — Susquehanna Waste Co., Upland, (selected list of bidders) factory addns., alterations, **$70,000.** Jack Swerman, 1 W. 3 St., Chester, archt.

●Tex., Houston — PIPE MILL—Consolidated Western Steel Corp., c/o U. S. Steel Corp., 2087 E. Slauson St., Los Angeles, Calif., 100,000 ton capacity pipe mill, 200,000 ton tube mill, $4,000,000; roads, area paving and water, sewers, gas, electric sys., $350,000. CD 10/12.

●Tex., Houston — PIPE MILL — A. O. Smith Corp. of Texas, M. Stapelcamp Bldg., 200x675 ft. pipe mill, $5,000,000; dirt work, drainage, $100,000; water sys., sewerage sys., roads, gas lines, area paving, lighting, $250,000. CD 9/29.

Ont., Toronto — WAREHOUSE, etc. —J. Thomson, archt., 32 Adelaide St. E., 1 story, part bsmnt., 90x90 ft., rein.-con., brick, warehouse, offices and truck garage, for Hoor Transport Co., 10 John St., Approx. **$75,000.**

SOON LETS CONTRACT

Calif., Los Angeles — FACTORY, etc. — General Paint Corp., 544 Mateo St., soon lets contract 70,000 sq. ft. steel frame factory, warehouse. Approx. **$200,000.** J. M. & T. M. Cooper, 490 S. San Vicente St., Los Angeles, archts.

Calif., San Francisco—CELLAR—Regal Amber Brewing Co., 675 Treat St., soon lets contract 5,000 sq. ft. concrete storage cellar Approx. $70,000. James M. Smith, 251 Keary St., engr.

Md., Baltimore—WAREHOUSE, etc.—J. J. Haines & Co., Inc., 33 Hopkins Pl., soon lets contract 1 story part bsmnt., 35,000 sq. ft., steel, brick concrete warehouse and office, concrete fdn. $300,000. Jan R. Saxe, 100 W. Monument St., engr.

Pa., Easton — PLANT — Victor Balata & Textile Belting Co., 25 and Freemansburg Ave., soon lets contract plant, $250,000. John F. Wolffe Jr., Cloverly Rd., Jenkintown, engrs. CD 6/23/47.

Pa., Phoenix—MILL—Royfel Hosiery Mill Inc., Kimberton, soon lets contract steel masonry hosiery mill addn., $70,000. Charles Talley, 314 S. Broad St., Telford, archt.

Pa., Sharon—WAREHOUSE — Pittsburgh Gage & Supply Co., 3000 Liberty Ave., Pittsburgh, soon lets contract 1 story, 30x38 ft. brick, concrete block, 1 sty., 60x160 ft. steel warehouse. $75,000. Franklin Douden & Assoc., 522 Century Bldg., Pittsburgh, archts.

Tex., Houston—PLANT—Cook Heat Treating Co. of Texas, 6233 Navigation Blvd., soon lets contract structural steel metal siding plant. $75,000 MacKie & Kamrath, 2713 Ferndale St., Houston, archts. CD 8/24.

Tex., Irving—TERMINAL STATION—Humble Oil & Refining Co., Sales Dept., 3010 McKinney St., soon lets contract structural steel frame gas terminal station addn., concrete slab fdn., etc. $150,000. LeRoy F. Skubis, 53 W. Jackson Blvd., Chicago, Ill., archts. CD 4/30.

LOW BIDDERS

Mass., Springfield—LAUNDRY—Globe Laundry & Dry Cleaners, 48 Howard St., 1 and 2 story, brick, concrete laundry addn., Howard St., from C. S. Hardy & Son, 5 Logan St., Approx. **$68,000.** John D. Phillips, 1634 Main St., archt.

R. I., Providence—SALES and SERVICE—Colonial Motors, Inc., 1270 N. Main St., rejected bids, 2 brick, cinder block sales and service addns., N. Main St. Est. **$110,000.** CD 8/10.

CONTRACTS AWARDED

Calif., Los Angeles—FACTORY, etc.—Packard-Bell Co., 12333 W. Olympic St., design and construction factory and office, to The Austin Co., 777 E. Washington St., **$135,000.**

Calif., Petaluma — FEED MILL — Allec Poultry Products Co., Copeland and D Sts., feed mill, to So-Mar Constr. Co., 138 Kentucky St., Approx. **$200,000.**

●Calif., San Francisco — FACTORY, etc. — Owner, c/o Walter Monroe Cory, archt., 38 W. 40 St., New York, N. Y., 6 story, 400x600 ft. factory and warehouse, 5, 6 and Channel and Industrial Sts., to John J. Moore Co., 959 33 St., Oakland. Approx. **$8,000,000.** Russell H. Cooley, 959 33 St., Oakland, engr.

Calif., San Jose — TRUCK CENTER — California Motor Express Co., 1490 First St., truck center, incl. 60x143 ft. solid cement platform, etc., to Greuner Constr. Co., 430 4 St., Oakland, Approx. **$80,000.**

●Colo., Rocky Ford—PLANT—Southern Colorado Power Co., Rocky Ford, 7500-kw. steam turbine plant, to Stearns-Roger Mfg. Co., 1720 California St., Denver, Est. **$2,000,000.** CD 1/14.

Conn., Hartford — WAREHOUSE—General Fireproofing Co., 130 Allyn St., 2 story, bsmnt., brick, steel warehouse, Union St., to Massoce Builders, Inc., Meadow Plains Rd., Simsbury, **$109,274.** CD 9/21. Bids 9/27.

Conn., New Haven—WAREHOUSE—E. I. duPont Co., 60 River St., 1 story, 95x130 ft., brick, concrete warehouse, River St. Owner builds. **$68,000.**

Fla., Panama City — PLANT — Standard Oil Co. of Kentucky, 426 W. Bloom St., Louisville, Ky., lubricating oil canning and barreling plant, steel piers, pumping and storage facilities to George D. Auchter Co., foot of E. 56 St., Jacksonville, Zone 1, **$500,000.** Awarded 10/14. Fred R. Schwarz, Standard Oil Bldg., Jacksonville, Zone 4, engr.

Ill., Chicago — PLANT — Atlantic Steel Co., 5433 N. Damen St., Zone 40, 70x120 ft., steel, concrete, brick plant addn., Goodwin St., to Massoce Builders, Inc., Meadow Plains Rd., Simsbury, **$75,000.** Albert R. Hauser, 201 N. Wells St., Zone 6, archt.

Ill., Chicago — TERMINAL — Greyhound Corp., 141 W. Jackson St., Zone 4, terminal bldg., to Herlihy Midcontinent Co., 79 W. Monroe St., Zone 3, **$280,000.** Bids 8/30, awarded 10/6. CD 8/19.

Ill., Chicago—TERMINAL—Mid-States Terminal, 5700 S. Pulaski St., Zone 36, 1 story, 70x420 ft., steel, concrete truck terminal, 10,000 sq. ft. brick office and garage, separate contracts. **$175,000.** W. Scott Armstrong, 109 N. Dearborn St., Zone 2, archt.

Ill., Chicago — PLANT — Rheem Mfg. Co., 7606 S. Kedzie St., Zone 29, steel, concrete, brick plant, to L. E. Gawley Constr. Co., 10616 S. Fairfield, Zone 43, **$190,000.** Awarded 9/30

Ill., Chicago—BAKERY—Tom Tom-Tomale & Bakery Co., 1934 W. 47 St., Zone 9, 1 story, 100x100 ft. steel, brick, concrete bakery, 4750 S. Washtenaw St., Zone 32, to Erik A. Borg, 6648 W. Ridge Zone 26, **$240,000.** Awarded 9/30. Nicholas Z. Konstant, 134 N. Lasalle St., Zone 2, archt.

Ill., Libertyville — FACTORY — Frank G. Hough Co., E. Sunnyside Ave., 1 story, 100x200 ft., steel factory addn., to Campbell Lowrie -Lautermilch, 400 W. Madison St., Chicago, Zone 6, **$130,000.** E. O. Sessions Eng. Co., 1 N. La Salle St., Chicago, Zone 2, engr.

Ill., Skokie—FACTORY, etc.—Silver Skillet Brands, Inc., 7510 N. St. Louis St., 20,000 sq. ft. steel, concrete, brick factory and office, to Federal Constructors, 173 W. Madison St., Chicago, Zone 3, **$180,000.** Awarded 10/4. A. Epstein & Sons, Inc., 2011 W. Pershing St., Chicago, Zone 9, engrs.

La., New Orleans—PLANT—Louisiana Power & Light Co., c/o contractor, Ninemile Point Steam Electric Plant, to Boh Brothers Constr. Co., 2400 Cypress St., Approx. **$100,000.**

●Md., Baltimore — PLANT — American Can Co., 250 Park Ave., New York, N. Y., factory, 150,000 sq. ft. brick, steel plant, to Turner Constr. Co., 1500 Walnut St., Phila., Pa. **$1,500,000.** CD 12/28/45.

●Md., Baltimore—BREW HOUSE and STOCK HOUSE—National Brewing Co., c/o Gerald O'Donnell Sts., 9 story, concrete, steel, brick, brew house and stock house, to The Frantz Constr. Co., 10 W. Chase St., Approx. **$1,500,000.** Bids 10/44. CD 9/16.

Mass., Framingham—GARAGE—R. H. Long Motor Sales Co., Waverly St., 1 story, brick, steel auto sales service addn., Waverly St., to Tredennick & Billings Co., 10 High St., Boston, **$70,000.** Holmes & Edwards, 126 State St., Boston, archts.

Minn., Minneapolis—SALES ROOM—Grossman Chevrolet Co., 1304 E. Lake St., 1 story, 125x148 ft. sales room and service garage, at site, to H. N. Leighton Co., 716 S. 7 St., Approx. **$200,000.** Bids 9/8. CD 8/30.

Minn., Moorhead — PLANT — Minnesota Farm Bureau Service Co., 101 E. Fairfield Ave., St. Paul, general contract, 6 story, 60x230 ft. fertilizer plant between 18 and 20 Sts. north of Northern Pacific tracks, to Steenberg Constr. Co., W. 1268 First Natl. Bank Bldg., St. Paul. Approx. **$300,000.** Toltz, King & Day, 1509 Pioneer Bldg., St. Paul, archts. CD 9/13.

N. J., Hammonton — PLANT—John Capelli, 100 West End Ave., 1 story, 8,250 sq. ft., brick, masonry bottling and distribution plant, to John Falciani, Hammonton, **$70,000.** CD 1/10.

O., Cleveland—WAREHOUSE—Fisher Bros. Co., 2323 Lakeside St., 1 story, brick, block, steel warehouse, storage facilities, office, railroad siding, E. 40 and Gladstone Sts., to A. M. Highy Co., 2036 E. 22 St., **$300,000.** George

S. Rider Co., 3800 Terminal Bldg., archts. and engrs. CD 9/26.

O., Columbus—SALES and SERVICE—Columbus Buick Co., 5 St., sales and service Bldg., 5 and Broad Sts., to E. J. Will & Co., 2528 Tremont Rd., Approx. **$100,000.**

Pa., Bentleyville—LAMP HOUSE, etc.—Jones & Laughlin Steel Corp., 3 and Ross Sts., Pittsburgh, 1 story, 70x150 ft. and 40x40 ft. lamp house and bathhouse, brick and block construction, Kelfover Mine, Greenely Shaft, near here, to Uniontown Constr. Co., 144 E. Main St., Uniontown. Approx. **$75,000.**

Pa., Chester — FACTORY — Chester Dairy Supply Co., 345 Tilghman St., factory, to Nolan Bros., 524 Market St., **$70,000.** George M. Ewing, Western Saving Fund Bldg., Phila., archt.

R. I., Cranston—PLANT—P. Ballantine & Sons, 75 Freeman St., Newark, N. J., 1 story, 85x155 ft., brick, cinder block plant, Niantic Ave., to Wadhams & May Co., 15 Lewis St., Hartford, Conn. Approx. **$100,000.** Fred Inman, c/o owner, archt.

Tex., Gladewater — PLANT — T. W. Lee, Gladewater, 2 story 75x139 ft. masonry newspaper plant, air-conditioning, to Fred Dean, Gladewater, **$116,000.** W. L. Kelly & Assoc., Glover-Crim Bldg., Longview, engr. and archts.

Tex., Houston—WAREHOUSE—Mosher Steel Co., 3910 Washington Ave., warehouse, to Marshall Constr. Co., 4009 Center St., Approx. **$72,000.**

Tex., Lufkin — PACKING PLANT — Texas Southeastern R. R. Co., Lufkin, tomato packing plant. Owner builds. Approx. **$70,000.**

Tex., Missouri City—SALT MINE—Gulf Salt Co., Missouri City, salt mine expansion, own forces. **$110,000.** CD 10/4.

Tex., Sinton — PLANT—Sinton Co-operative Gin Co., Sinton, cotton gin plant. Owner builds. **$145,000.** CD 10/6.

Tex., Temple—PLANT—American Desk Mfg. Co., Temple, Oct. 11, mfg. plant, to Armco Drain & Metal Products Co., 1320 M & W Tower, Dallas **$111,000** for special designs, est. $100,000; rein.-con. fdns., from Quisle Constr. Co., 905 First Natl. Bank Bldg., Fort Worth, **$72,755.** CD 10/4.

Utah, Salt Lake City—WAREHOUSE, etc.—National Biscuit Co., 442 South 2nd West St., warehouse and office, to Dorland Constr. Co., 1309 Jefferson St., **$121,049.** Bids 9/26. CD 9/21.

Utah, Salt Lake City—WAREHOUSE, etc.—Wheeler General Tire Co., 315 East Broadway, warehouse and office, to Linden & Stam, 232 B St., **$116,000.** Miles E. Miller, Felt Bldg., archt.

Wash., Tacoma—PLANT—Stauffer Chemical Co., 636 California St., San Francisco, Calif., chemical plant, day labor, **$107,000.** CD 10/17.

Wash., Tacoma — PLANT — Tacoma News-Tribune, 711 St. Helens Ave., newspaper publishing plant addn., to Bonnell Constr. Co., 760½ Commerce St., Approx. **$70,000.** Lea, Pearson & Richards, Tacoma Bldg., archts.

Wis., Monroe—FACTORY—North Side Swiss Cheese Corp., R. 5, 1 story, 44x120 ft., concrete blocks, steel, cheese factory, concrete fdn. and floor. Owner builds. T. Hartman, 1702¼ 11 St., archt.

Wis., Wauwatosa—PLANT—S. B. Mfg. Co., 6122 W. Martin Dr., Zone 13, 1 story, 60x240 ft., steel, brick, concrete block, plant addn., concrete fdn. and floor, to Gebhard-Berghammer, Inc., 5420 W. State St., Milwaukee, Zone 8. R. E. Schaefer, 759 N. Milwaukee St., Milwaukee, Zone 2, archt.

Ont., East York (Toronto) — STORAGE — Howard Furnace & Foundries Ltd., 881 Yonge St., Toronto, 100x100 ft., concrete block, steel storage bldg., Dawes Rd. north of St. Clair Ave. E., to Plywood Fabricators, Ltd., 881 Yonge St., Toronto, Approx. **$75,000.** W. S. Hall, 53 Gerrard St. W., Toronto, engr.

Ont., Toronto — WAREHOUSE, etc. — Black & Decker Mfg. Co., Ltd., Fleet and Cooper Sts., 1 story, 97x146 ft., L-shaped, brick, tile, metal sash, steel warehouse and office and showroom, to A. W. Robertson Ltd., 57 Bloor

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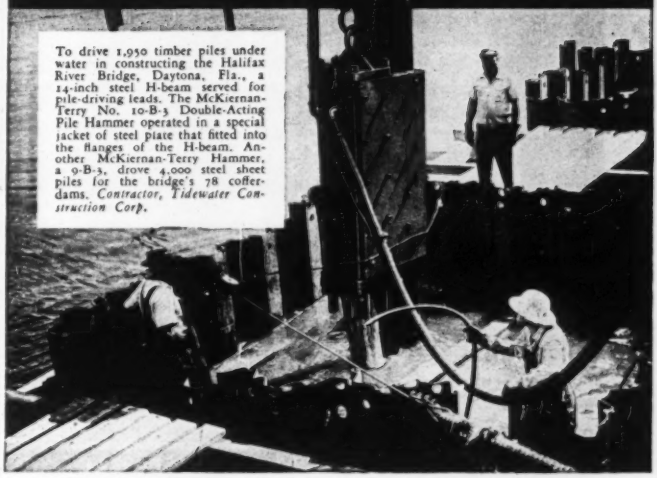

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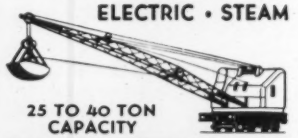

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BIDS ASKED

November 1

Que., Montreal—SHED—C. P. Buckley, secy., National Harbors Bd., West Block, Ottawa, Ont., Shed 10 exten. on downstream outer end of King Edward Pier, Montreal Harbor. Approx. $200,000. CD 1/28/48, under Industrial Buildings.

November 3

Kansas—RURAL DISTRIBUTION LINES—Northwest Kansas Electric Co-operative Assn., Inc., Bird City, approx. 308 mi. rural distr. lines, Rawlins and Cheyenne Counties. Proj. Kansas 49D-1 Cheyenne. Plans deposit $10. Wm. H. Burgwin, 2657 S. Broadway, Denver, Colo., engr. CD 8/8.

†**N. M., Los Alamos**—INCREMENT—U. S. Atomic Energy Comn., Los Alamos, third increment, misc. rehabilitation, general remodeling golf course addn., heating sys., incl. remodeling Bldg. T-18, Inv. No. 291-50-12. Approx. $250,000. Plans deposit $25.

November 7

†**Colorado**—HEATING AND VENTILATING BOARDS, etc.—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., heating and ventilating boards, distribution assembly, battery charger, motor boards, cabinet, transformers for Estes Power Plant, Estes and Marys Lake Power Plant penstock gate structures and Olympus dam, Colorado-Big Thompson Proj., Spec. R7-88 (Region 7). L. N. McClellan, ch. engr.

S. D., Beresford—ELECTRIC SYSEM—City, electric system exten. **$75,000.**

Washington — RURAL DISTRIBUTION LINES—Klickitat County Public Utility Dist. 1, Goldendale, 270 mi. rural distr. lines, Klickitat and Skamania Counties. Approx. $50,000. Plans deposit $10. Howard Zenier & Assoc., Vancouver, engrs. CD 11/21/45.

SOON LETS CONTRACT

Kansas—RURAL DISTRIBUTION LINES—Kaw Valley Electric Co-operative, 1513 Lane St., Topeka, soon lets contract 165.73 mi. rural distr. lines, 24.5 mi. conversion, Jackson, Shawnee, Douglas, Osage and Wabaunsee Counties, $175,000. CD 8/23.

N. Y., New York—FIELD HOUSE—Columbia University, 116 St. and Broadway, soon lets contract field house, 533 W. 218 St., $528,000. Eggers & Higgins, 542 Fifth Ave., archts. CD 7/25.

Texas—RURAL DISTRIBUTION LINES—Southwest Texas Electric Co-operative, Eldorado, soon lets contract 120 mi. rural distr. lines, Schleicher Co. $110,000. Lodal & Assoc., 1408 Transit Tower, San Antonio, engrs. CD 10/4.

LOW BIDDERS

Calif., Albany—SWIMMING POOL, etc.—Albany Unified School Dist., 1009 Santa Fe Ave., Oct. 8, 40x100 ft. masonry swimming pool and building at Albany High School, from John M. Bartlett, 703 Everett St., El Cerrito. **$162,677.**

Calif., Los Angeles—PLAYGROUND BLDG.—City, Oct. 13, 52x152 ft. playground clubhouse, Bunker Hill Playground, from Mandorbach Constr. Co., 1837 Victory Blvd. **$121,646.** Est. $68,000.

Calif., San Francisco—COACH LINE—Public Utilities Comn., City Hall, Oct. 11, overhead trolley coach line on Mission St., from Severen Electric Co., 242 Natoma St., San Francisco. **$162,857.**

La., Colfax—NATURAL GAS SYSTEM—Town, Oct. 7, natural gas sys., from J. E. Tyler, P.O. Box 85, Logansport. **$257,837.** CD 6/6.

Missouri—RURAL DISTRIBUTION LINES—Black River Electric Co-operative, Ironton, cancelled bids to have been opened Aug. 10, 132 mi. rural distr. lines, K-L-M section, Iron Co. CD 7/28.

N. J., Port Newark—RAILROAD SPUR TRACKS—Port of New York Auth., 111 Eighth Ave., New York, 11, N. Y., Oct. 13, railroad spur tracks for transit sheds in Blocks 14A and 10-15, Contr. PN-7, from Railroad Constr. Co., 481 Summer St., Paterson, N. J., **$88,062.** CD 9/29.

N. Y., Sonyea—FIRE PROTECTION—Bureau Contracts & Accounts, Albany, fire protection and exit facilities, Bldgs. 16 to 22 (inclusive), 33 to 48 (inclusive) and 50 and 51, Craig Colony, from Brownell Constr. Co., 1165 E. 45 St., Brooklyn. **$143,750.**

Oregon—RURAL DISTRIBUTION LINES—Blachly-Lane County Co-operative Electric Assn., Blachly, rejected bids Sept. 27 50 mi. rural distr. lines, Lane Co., L.B. **$102,224.** CD 10/6, under L.H.

Oregon—TRANSFORMERS—U. S. Eng., 628 Pittock Block, Portland, Zone 5, furnishing six 29,000 kva. transformers for Detroit Dam, North Santiam River, Marion Co.: CIVENG 35-026-50-74, from Pennsylvania Transformer Co., Canonsburg, Pa., **$420,867.**

South Dakota—RURAL DISTRIBUTION LINES—Rosebud Electric Assn., Winner, Oct. 11, approx. 297 mi. rural distr. lines, Gregory Co. from Commonwealth Contractors, Pierz, Minn., **$289,143.** CD 9/27.

Tex., Corpus Christi — PARK — Nueces Co., Courthouse, rejected bids Oct. 8, Proj. 3,

Padre Island County Park L.B. **$133,471**, est. $175,000; Proj. 4, L. B. **$136,641.** CD 9/21

CONTRACTS AWARDED

Ind., Ghent—DRIVE-IN THEATER—Riverview Drive-in Theater, c/o R. L. Gaines, Riverview Dairy, Carrollton, Ky., 1000-car drive-in motion picture theater, U.S. 42, 3½ mi. west of here, separate contracts. **$100,000.**

Iowa — RURAL DISTRIBUTION LINES — Farmers Electric Co-operative, Greenfield, 221.4 mi. rural distr. lines, Adair, Guthrie, Adams, Union, Madison, Cass and Audubon Counties, to Ferguson-Diehl, Jefferson. **$280,-205.** Bids 10/4. CD 9/16.

Ia., Keokuk—DRIVE-IN THEATER—Andy Dietz & Assoc., 3142 Olive St., St. Louis 3, Mo., 700 car drive-in motion picture theater, Rte. 108, between Keokuk and Fort Madison, on 12 acre tract outside of Keokuk, separate contracts. Approx. **$100,000.**

New York—STATION FINISH—Bd. Transportation, 250 Hudson St., New York, Zone 13, station finish for 179 St. Station, Queens Co., to Waraham Constr. Corp., 101 Park Ave., New York, Zone 17, **$541,279.** Bids 9/23. CD 10/6, under LB.

O., Toledo—SWIMMING POOL, etc.—City, Arthur Gratop, city welfare dir., Toledo, swimming pool and bathhouse, Navarre Park, to A. Bentley & Sons Co., 201 Belmont St., **$120,-900.** Est. $100,000. Bids 9/27. CD 9/21.

Oklahoma—RURAL DISTRIBUTION LINES —Northfork Electric Co-operative, Sayre, 207 mi. rural distr. lines, Beckham Co., to B-Line Constr. Co., First Natl. Bldg., Oklahoma City, Zone 2. **$182,273.** Est. $200,000. Awarded 10/4. CD 3/11.

†Oklahoma—ELECTRIC POWER LINES—Southeastern Power Admin., c/o Lee Simmons, Barrett Bldg., Denison, Tex., repairing, exten. electric power lines, from vicinity of Colbert, and exten. from Dam area north into sects. of Southern Oklahoma, own forces. **$650,000.** CD 10/12.

Pa., Bellevue—BATHHOUSE, etc.—Bellevue Boro, Boro Hall, bathhouse, shelter house, swimming pool, landscaping, etc., to Landau Bros. Bldg. Co., 125 1st. Ave., Pittsburgh. Approx. **$250,000.** Charles and Edward Stotz, Jr., Bessemer Bldg., Pittsburgh, archts. Bids 9/30.

Pa., Harrisburg — STREET LIGHTING — Pennsylvania Power & Light Co., 22 N. 2 St., approx. 375 high level street light standards and installing new underground duct lines, own forces. Approx. **$250,000.** CD 6/29/44, under Public Buildings.

Texas—NATURAL GAS LINE—Kerr-McGee Oil Industries, Inc., Dumas, 10 mi. 10 in. natural gas line from field to Phillips Plant near Etter, Purchase and Hire. Approx. **$180,000.** CD 10/6.

†Texas—ELECTRIC POWER LINES—Southwestern Power Admin., c/o Lee Simmons, Barrett Bldg., Denison, repairing, exten. electric power lines, in various sects. out of Denison in North Texas, own forces. **$750,000.** CD 4/6.

Tex., Galveston — WHARVES — Galveston Wharves, 2324 Strand St., rein.-con. substructure for wharves, to Unbehagen & Rasmussen, 5020 Avenue R, **$129,000;** steel, structural steel frame superstructure for wharves to Southen Steel Tractors, 609 Burress St., Houston, **$221,000.** CD 10/17, under Industrial Buildings.

Tex., McAllen—STREET LIGHTING—City, addnl. outside street lighting, force account. Sisler, Clark & Winston, Weslaco, engrs.

Alta., Stony Plain—WELL DRILLING—Okalta Oils Ltd., Calgary well drilling, own forces. **$90,000.**

British Columbia—RIGHT-OF-WAY CLEARING — Pacific Great Eastern Ry., Parliament Bldgs., Victoria, clearing and grading 17 mi. section for extens. to Pacific Great Eastern Ry., south of Prince George, to Jamieson Constr. Co., Ltd., 904 E. Hastings St., Vancouver, **$616,902.** Bids 9/2, awarded 10/12. CD 9/8, under LB.

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PROPOSED PROJECTS

WATER SUPPLY

La., Dubach — Town, WW. Imprv. voted bonds **$35,000.** CD 8/17.

●Md., Hyattsville — Washington Suburban Sanitary Comn., Hamilton St., 6 m. g. dam and reservoir, Patuxent River, near Laurel, **$3,573,000;** 55,000 ft. pipeline from Willis School to Wheaton reservoir, **$1,625,000;** 75,850 ft. water supply line, incl. 14,000 ft. Metzerott Rd. to University Lane, 1,440 ft. University Lane and Ager Rd., 5,500 ft. Old Colesville Rd. from Metzerott Rd. to University Lane, 5,020 ft. Old Colesville Rd. from Wells Blvd. to Queens Chapel Rd., 1,340 ft. College Heights Dr. and Clagett Rd., 1,300 ft. Forty-first Ave., Hyattsville, from Hamilton St. to Emerson St., 38,700 ft. Hamilton Ave. to intersection of Edmonston and Breenbelt Rds., 4,050 ft. Sheriff Rd. between 64 Ave. and Hill Rd., and 4,500 ft. Massachusetts Ave., extended, **$1,146,465;** 82,140 ft. supply lines, incl. 23,340 ft. Willis School to Beltsville, 14,950 ft. Beltsville to Greenbelt, 5,550 ft. Greenbelt to Glendale, 14,250 ft. Defense Hy. to George Palmer Hy., 8,000 ft. Central Ave. to Pine Grove School, 7,800 ft. Walker Mill Rd. from Pine Grove School to Marlboro Pike, and 8,250 ft. Marlboro Pike to Suitland, **$588,100;** 10,000 ft. supply lines, Rocky Gorge Pumping Station, on Patuxent River, 1 mi. west of Laurel, to Willis School, incl. Laurel, **$300,000;** 2½ m. g. storage tank, Riggs Rd. and University Lane **$85,000,** and 4 m. g. storage tank in Rogers Heights, **$157,000,** all foregoing in Montgomery and Prince Georges Counties. Harry L. Hall, c/o owner, clh. engrs.

●O., Berlin—Mahoning Valley Sanitary Dist., Mineral Ridge, Youngstown, intake tower, supply conduit, pump station, pipeline, settling basins, mixing chambers, main drain, raw water pump, addnl. sand filters and 2 pumps, Meander Dam. **$4,853,000.**

Tex., Baytown—Harris County Fresh Water Dist. 8, Baytown, voted bonds, Oct. 8, WW extens. imprvs. **$200,000.** Joe J. Rady, 811 American Fidelity Bldg., Fort Worth, consult. engr. CD 9/26.

Tex., Katy—City, voted bonds Oct. 8, WW. **$125,000.**

SEWERS, WASTE DISPOSAL

Colo., Denver—City and Denver Co., T. P. Campbell, mgr., mgr. of Parks & Imprvs., City and County Bldg., sewers and appurtenances, Montclair Storm Sewer Dist. No. 1, **$205,900.** Terry Owens, city engr.

Ind., Valparaiso—Bd. P. Wks., City Hall, sewage treatment plant, **$500,000.** O. M. Leonard & Assoc., 2325 Franklin St., Michigan City, Indianapolis, engrs. CD 4/24/47.

Kan. Topeka—City, City Hall, voted **$366,000** bonds, Sept 24, Highland Park sewer. W. C. Haibry, city engr. CD 10/4.

Minn., Le Center—Village, M. Bowler, clk., sewer facilities, sewage treatment plant, exten. storm and sanitary collection sys **$151,633.** R. D. Thomas & Assoc., 400 Metropolitan Life Bldg., Minneapolis, consult. engrs. CD 10/18/45.

O., Cleveland—City, City Hall, Lakeside and 6 Sts., bond election Nov. 8, sewers in newly developed areas, intercepting and flood relief sewers, replacing old sewers and stream enclosures, **$2,000,000.** C. J. Wenrick, city engr. CD 3/1/43.

Tex., Baytown—Harris County Fresh Water Dist. 8, Baytown, voted bonds Oct. 8, sanitary sewer extens. **$225,000.** Joe J. Rady, 811 American Fidelity Bldg., Fort Worth, consult. engr. CD 9/26.

Tex., Pleasanton—City, cancelled bond election to have been held Oct. 8, sewage disposal plant, **$55,000;** sanitary sewer collection lines, **$70,000.** Will set new date little later. James V. Turnutte, 1622 Transit Tower, consult. engr. CD 9/20.

BRIDGES

Ind., Hammond—Bd. Comrs. Lake Co., Stanley E. Olszewski, aud., Court House, Crown Point, rein.-con. bridge over Little Calumet River, Columbia Ave., **$165,000.** Samuel E. Brownsten, 6447 Kennedy Ave., co. engr.

Nebraska—State Dpt. Roads & Irrigation, Lincoln.

Douglas Co.—Q Street viaduct in Omaha. Approx. **$650,000.** F. H. Klietsch, c/o owner, state engr.

●O., Cleveland—City, City Hall, Lakeside and 6 Sts., bond election November 8, land acquisition, bulkhead, east of Duanbrook, incl. other shore protection projects at various locations. **$1,000,000.** CD 12/1/48.

STREETS AND ROADS

Calif., Los Angeles—Los Angeles Co., 501 Hall of Records, curbs, gutters, streets in Passage Ave. and Glee Sts., C. I. 1336, Bellflower, **$51,800;** curbs, gutters, walks in 153 St., Lawndale, **$54,000.** C. E. Arnold, co. engr.

Idaho, Boise—City, City Hall, exten. 1 mi. 16 St., to Crescent Rim Distr. **$175,000.** Johnson & Palmer, McCarty Bldg., consult. engrs. CD 9/7/48.

Minn., Minneapolis—City, City Hall, paving Grand Ave. from 34 to 48 Sts., **$166,000.** H. Erickson, city engr.

Tex., Dallas—Terminal Building Corp., 2nd unit of Santa Fe Bldg., grading, paving streets in 322 acre industrial plot. **$100,000.**

●†Washington—U. S. Eng., 4735 E Marginal Way, Seattle, Zone 4, grading, surf. 10.6 mi. access Dy. to Chief Joseph Dam site, Bridgeport. **$1,000,000.** CD 9/21/44.

EARTHWORK, WATERWAYS

●†Washington—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, excav. right-bank abutment of Chief Joseph Dam, **$1,500,000;** station service turbines for Chief Joseph Dam Powerhouse, **$70,000.** CD 9/12/44.

Wash., Blaine—Bellingham Port Comn., Municipal Dock, Bellingham, dredging harbor with rock breakwater and bulkhead. **$169,000.**

●Alberta—Government of Canada, Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., completion irrigation to Medicine Hat, **$3,500,000.** Dpt. Agriculture, Ottawa, engr.

AIRPORTS AND AIRBASES

●Calif., San Francisco—AIRPORT BLDGS.—Pub. Utilities Comn. of City and San Francisco Co., City Hall, **$10,000,000** bond election Nov. 8, airport bldgs., incl. $4,000,000 new terminal bldg., Mills Field imprvs., San Francisco municipal airport, near San Bruno, W. P. Day & Assoc., archts., 111 New Montgomery St., preparing plans for bldgs. CD 11/18/48.

●O., Cleveland—AIRPORT—City, City Hall, Lakeside and 6 Sts., bond election Nov. 8, land acquisition runways, east, west, on south side of municipal field, mat reconstruction and misc. imprvs., incl. backfill, sewer extens. and surf. at Lakefront Airfield, **$5,500,000.** C. J. Wenrick, city engr. CD 12/10/43.

LATIN AMERICA

Mexico, Mexico City—Penate, S. de R. L., Lic. Carlos Campuzano Onate, rep., Cipres, 280, Mexico, D. F., Mex., plans reactor and transformer factory. **$250,000.**

Mexico, Monterrey—PeMex Petroleum Dpt., Mexican Fed. Govt., Mexico City, plans refinery. **$3,500,000.**

PUBLIC BUILDINGS

Ark., Fordyce — HOSPITAL — Dallas Co., Fordyce, bond election Oct. 26, hospital, **$300,000** with equip.

Calif., Burbank — ARMORY — State Div. Architecture, P. Wks. Bldg., Sacramento, plans by Ainsworth, Douglas & Freeman, 1199 E. Walnut St., Pasadena, National Guard Armory, **$295,000.**

Calif., El Monte—SCHOOL FACILITIES—Mountain View School Dist., 222 Mountain View Rd., El Monte, voted **$324,000** bonds, school facilities. Kistner, Curtis, Wright &16 W. 5 St., Los Angeles, archts.

Calif., Fresno—ARMORY—State Div. Architecture, P. Wks. Bldg., Sacramento, plans by Franklin & Simpson, 752 Fulton St., Fresno, National Guard Armory. **$314,000.**

Calif., Fresno — AUDITORIUM — State Div. Architecture, P. Wks. Bldg., Sacramento, plans by Dwight Cubbs, 317 Spring St., Los Angeles, auditorium at Fresno State College, **$353,000.** CD 2/28/45.

Calif., Long Beach—ARMORY—State Div. Architecture, P. Wks. Bldg., Sacramento, plans by Parkinson, Powelson, Briney & Woodford, 416 N. La Brea St., Los Angeles, National Guard Armory. **$400,000.**

●Calif., Los Angeles—HOSPITAL—Los Angeles Co., 501 Hall of Records, $4,500,000 bond election, contagious diseases hospital, **$4,000,000** and nurses home, **$500,000.** Paul R. Williams & Adrian, Wilson, 816 W. 5 St., archts. CD 5/8/48.

Calif., Los Angeles—SHOP, etc.—Los Angeles Co., 501 Hall of Records, plans by Nelson P. Rice, 354 S. Spring St., Los Angeles, maintenance yard for traffic and sign division of Road Dept. in City Terrace, paint and sign shop, office, and storage, **$240,000.**

●Calif., Sacramento—GARAGE—State Div. Architecture, P. Wks. Bldg., plans by Leonard F. Starks, 416 Native Sons Bldg., garage for Dpt. Finance, **$1,020,000.**

Calif., San Carlos—SCHOOL—Sequoia Union High School Dist., Redwood City, plans by Frank Wynkoop, 1638 Market St., San Francisco, San Carlos-Belmont High School, Approx **$250,000.**

●Calif., San Francisco—COLLEGE BLDGS.—State Div. Architecture, P. Wks. Bldg., Sacramento, plans by E. Geoffrey Bangs, 605 Market St., fine arts bldg., **$428,270;** plans by Wm. G. Merchant, 57 Post St., San Francisco, cafeteria and classroom at San Francisco State Teachers College, **$992,180.** CD 2/21/46.

Calif., Santa Rosa—SCHOOLS—Santa Rosa Bd. Educ., Santa Rosa, voted **$541,500** bonds for elementary schools and **$350,000** for gymnasium-auditorium, music room, addn. to Junior High School. CD 9/12.

●Calif., Walnut Creek—HIGH SCHOOL—Walnut Creek High School Dist., c/o Supt. Schools, Acalanes Union High School, Lafayette, plans by Kump & Falk, 9 Main St., San Francisco, high school, **$2,000,000.**

Fla., Fernandina—SCHOOL—Bd. Pub. Instruction, Fernandina, voted bonds county school **$765,000.**

●Fla., Panama City—SCHOOLS—Bd. Pub. Instruction, Panama City, voted bonds schools. **$2,500,000.**

●Ga., Brunswick — HOUSING — Brunswick Housing Auth., Pierce Thiot, dir., 200 housing units, **$1,700,000.**

Idaho, Idaho Falls—AUDITORIUM — City, City Hall, municipal auditorium, **$550,000.**

Idaho, Idaho Falls—SCHOOL—School Bd., voted bonds, high school, **$922,000.** CD 10/26/45.

Ind., Muncie—SCHOOL—City, plans by Gene Hamilton, West Reserve Bldg., school, southeast part of city, Burlington Ave. and 9 St., **$300,000.** CD 5/3/48.

●Ky., Fort Thomas — HOSPITAL — Campbell Co. Fiscal Court, Court House, 5 and York Sts., Newport, plans by Potter Tyler-Martin & Roth, 128 E. 16 St., Keakirt Bldg., Cincinnati, O., 5 story, basmt., rein.-con., brick T-shaped County Hospital, **$1,489,269.** CD 1/22/48, under **Ky., Newport.**

●Mass., Lynn—HOUSING—City of Lynn Housing Auth., John Cavanaugh, chn., 58 Andrews St., plans by F. J. Schumacher, 102 Mt. Auburn St., Cambridge, 2 story, 406 unit, row type, brick Veterans Housing, Winnepurket Ave. Approx. **$4,000,000.** CD 6/30.

Mass., Needham—SCHOOL—Town, Supt. Schools, plans by W. G. Upham, 700 Washington St., Norwood, William Mitchell Elementary School, Brookline St., Needham Heights, **$476,500.**

Mo., Columbia — AGRICULTURAL — Bd. Curators, University of Missouri, Leslie Cowan, secy., Jesse Hall, plans by Jamieson & Spearl, 1926 Arcade Bldg., 812 Olive St., St. Louis, Zone 1, brick, stone, concrete, steel agricultural department bldg. **$825,000,** will equip. CD 7/24/47.

●Mont., Galen—SANITARIUM—State Tuberculosis Sanitarium, Dr. F. L. Terrill, supt., plans by Gus Link of J. G. Link & Co., Butte, and Andrew Van Teylingen, Great Falls, 2 wing addn. on hospital and apartment, sewage disposal, and enlarged water and sewage lines. **$3,000,000.** CD 9/13/45.

●N. J., Burlington — HOUSING — Burlington Housing Auth., Burlington, housing, **$1,500,000.**

●N. Y., Brooklyn—SUPREME COURT—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, plans by Shreve, Lamb & Harmon Assoc., 11 W. 44 St., New York, Zone 18, 11 story, penthouse supreme court bldg., Adams St. **$10,000,000.** CD 11/11/46.

N. Y., Brooklyn—OFFICE, etc.—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, plans by Sohn & Weston, 44 Court St., Zone 2, 5 story combination office bldg. and firehouse Jay St. and Tillary St., for Fire Dpt. **$950,000.** CD 6/17/46.

●O., Cincinnati — LIBRARY — Bd. Comrs., Hamilton and Bd. Library Trustees, Courthouse, plans by A. Morton Githens, 623 N. Columbus Ave., Vernon Manor, Mt. Vernon, **$6,000,000.** Bodenstein & Schusler, 9 and Main Sts., consult. engrs. CD 11/19/48.

●O., Cleveland—FIRE STATIONS, etc.—City, City Hall, Lakeside and 6 Sts., bond election Nov. 8, 7 fire stations, municipal court bldg., fireman school, police stations and broadcasting stations. **$2,000,000.** C. J. Wenrick, city engr. CD 6/8/44 and CD 7/13/44.

●O., Cleveland—GARAGE, etc.—City, City Hall, Lakeside and 6 Sts., bond election Nov. 8, maintenance and storage bldg. **$1,000,000.** A. Gattozzi, c/o owner, archt. CD 9/29/44.

●O., Lima—HOSPITAL—State Welfare Dpt., Columbus, plans by Sims, Cornelius & Schooley, 2901 N. High St., Columbus, 300 bed psychopathic bldg. at Lima State Hospital. **$1,450,000.**

O., Ottawa Hills—SCHOOL—Bd. Educ., Ottawa Hills, **$265,000** bond election Nov. 8, school imprvs.

O., Oxford—SCHOOL—Bd. Educ., Oxford, plans by David Maxfield, 225 E. Withrow Ave., brick, Stewart School, concrete fdn. **$300,000.** Hunt & Allen, 914 Main St., Cincinnati, consult. engrs. CD 11/19/48.

O., Ravenna—SCHOOLS—Bd. Educ., Ravenna, **$650,000** bond election Nov. 8, elementary schools and imprv. high school. CD 6/30.

O., Spencerville — SCHOOL—Bd. Educ., Spencerville, **$300,000** bond election Nov. 8, school. CD 4/18.

Pa., Lansdale — SCHOOL — Lansdale Boro School Bd., Lansdale, plans by Heacock & Pilats, 152 N. 15 St., Phila., school, **$300,000.** CD 10/24/46.

●Pa., Pottstown — HOUSING — Montgomery County Housing Auth., P.O. Box 189, Pottstown, housing, **$1,600,000.**

Tex., Anson—HOSPITAL—City, masonry 30 bed hospital. **$250,000.**

Tex., Beaumont—SCHOOLS—Beaumont Independent School Dist., Beaumont, plans by Stone & Pitts, 1872 Calder St., masonry James Bowie Junior High School, concrete slab fdn.

$400,000; masonry Longfellow School, concrete slab fdn., $300,000.

Tex., Eagle Pass—SCHOOL—Eagle Pass Independent School Dist., Eagle Pass, plans by Phelps & De Wees & Simons, 1501-6 Majestic Bldg., San Antonio, brick, concrete school, concrete slab fdn., $265,000. CD 6/4/45.

Tex., Marlin—SCHOOLS—Marlin Independent School Dist., Marlin, plans by Thomas, Jameson & Merrill, 820 N. Harwood St., Dallas, masonry Negro High School, concrete slab fdn., $250,000; masonry school, concrete slab fdn., $330,000. Landauer & Guerrero, 4801 Lemmon St., Dallas, mechanical engrs. CD 2/16.

Tex., San Antonio—SCHOOL—Harlandale Independent School Dist., Wm. Spivey, secy., W. Huff St., voted $450,000 bonds, masonry school in Mayfield Park area, $250,000. Phelps & DeWees & Simmons, 1501 Majestic Bldg., consult. archts. CD 9/30.

●†**Washington**—BUILDINGS—U. S. Eng., 4735 E. Marginal Way., Seattle, Zone 4, buildings, utilities for government facilities at Chief Joseph Dam site, $1,500,000. CD 9/21/44.

†**Wash., Ephrata** — ADMINISTRATION — Dpt. Interior, Bureau Reclamation, Bldg. 1-A, Denver Federal Center, Denver, Colo., administration bldg. $725,000. CD 6/4/47.

Wash., Pasco—SCHOOL—School Bd., Pasco, plans by Robinson & Roberts, Pasco, school to replace Longfellow School, $260,000. CD 9/23.

Ont., Manor Park (near Ottawa)—SCHOOL—School Bd., Manor Park, J. S. Rutledge, chn., school. Approx. $275,000. J. C. Wilker, Carleton County School Inspector.

COMMERCIAL BUILDINGS

Fla., Miami—LAW—University of Miami, 1200 Campo Santo Ave., Coral Gables, law building at University of Miami, $400,000.

Ga., Augusta—APARTMENT DEVELOPMENT—Sherman & Hemstreet, Inc., Augusta, apartment development. Approx. $500,000.

Ill., Chicago—SCHOOL—St. Eugene Parish, 5330 N. Canfield St., Zone 31, plans by Frank J. Serpico, 4809 N. Milwaukee St., Zone 30, 1 story, bsmnt., 60x100 ft. and 50x75 ft., steel, concrete, brick parochial school, $270,000.

Ind., Fort Wayne—PARKING—Patterson-Foelber Realty Co., Pohlmeyer & Pohlmeyer, archts., 262 Central Bldg., 2 story, bsmnt., 50x80 ft., brick, limestone parking bldg., Wayne and Ewing Sts.

●**Ky., Louisville**—HOSPITAL—Bd. Trustees Jewish Hospital, 236 E. Kentucky St., plans by Joseph & Joseph, Speed Bldg., hospital, $1,200,000.

Minn., Minneapolis — SCHOOL — Talmud Torah, Beth El Synagogue, 14 and Penn Aves. N., plans by Lang & Raugland, 802 Wesley Temple Bldg., 3 story modern school, 725 Fremont Ave. N. Approx. $250,000.

Mo., Springfield—HOSPITAL—Baptist Hospital, 440 S. Market St., plans by Hawkins & Esterly, McDaniel Bldg., hospital addn. $300,000.

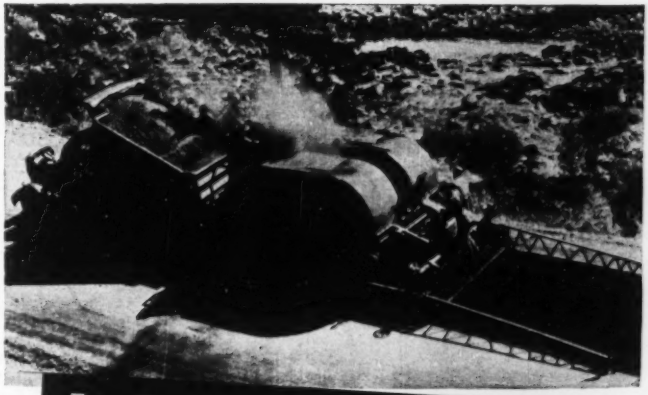
N. Y., Brooklyn—SCHOOL, etc. Holy Family Roman Catholic Church, 9719 Flatlands Ave., plans by G. J. Sole, 110 E. 42 St., New York, Zone 17, church and school, Flatlands Ave. and Rockaway Parkway, $250,000. CD 4/4/45.

N. Y., Brooklyn—COLLEGE—Packer Collegiate Institute, 170 Joralemon St., wing to college bldg. incl. theater and gymnasium. $650,000. CD 4/4/45.

N. Y., Forest Hills—APARTMENT—Yate Realty Corp., c/o C. B. Greenberg, archt., 63 Fifth Ave., New York, Zone 17, 6 story apartment, Booth St. east of 67 Dr. $800,000.

N. Y., New York—OUT PATIENT—Beth Israel Hospital, Stuyvesant Park East and 17 St., Zone 3, plans by Charles B. Meyer, 31 Union Square, Zone 3, out-patient bldg., 322-33 E. 16 St. $654,000.

N. Y., New York—EXCHANGE—New York Telephone Co., 140 West St., Zone 7, plans by Voorhees, Walker, Foley & Smith, 101 Park Ave., Zone 7, altering telephone exchange, 193 Manhattan Ave. $600,000.



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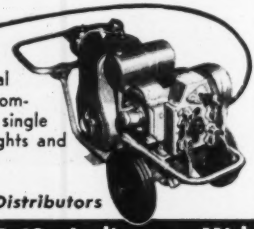

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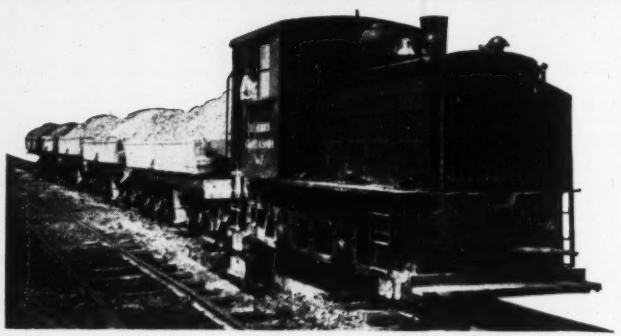

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PLYMOUTH LOCOMOTIVE WORKS

DEPT. A-4 **PLYMOUTH, OHIO**

O., Cleveland—HOTEL, etc.—Norge Constr. Co., 1742 E. 23 St., 3 story, brick, steel hotel, 1 story store, at about E. 22 St. and Prospect.

●**O., Dayton**—HIGH SCHOOL—Chaminade High School, Brother Matthew Betz, principal, 108 Franklin St., Catholic High School. **$1,200,000.**

O., Springfield Twp.—RESIDENCES—Allen Paul, 8451 Curzon Ave., Cincinnati, 38 frame prefabricated residences. **$380,000.**

Tex., Houston—DWELLINGS—R. C. Heiner, 7443 Park Pl. Blvd., addnl. 25 dwellings, in Sect. 4, Santa Rosa Addn. **$268,750.**

●**Tex., Houston** — APARTMENTS — King & Sheets Co., City Natl. Bank Bldg., plans by Joseph B. Reynolds, 3401 S. Shepherd St., 100 masonry, frame efficiency apartments, concrete slab fdn., along Childress and Perdue Sts. off Bissonnets Plaza. **$530,000**; 250 rental frame, masonry apartment units, concrete slab fdns., Mercer and Buffington Speedway off Bissonnett Plaza. **$2,000,000.**

Tex., San Antonio—HOUSING—Acme Lumber & Supply Co. Inc., 1001 Austin St., housing, 1,100 to 1,700 sq. ft. each, brick and masonry, concrete slab fdn. **$500,000.**

Tex., San Antonio — HOUSING — Johnnie Chuoke, 109 Tuttle St., addnl. housing, concrete slab fdns., in Terrell Hills area. **$400,000.**

Tex., San Antonio—DWELLING—Lee & Ortz, Gunter Bldg., 120 dwellings, Basse and Blanco Rds. area. **$600,000.**

Tex., San Antonio — DWELLINGS — Texas Development Co., Alamo Natl. Bldg., plans by Nayfach-Richey Co., Alamo Natl. Bldg., 22 addnl. dwellings, W. Grammery Brees Blvd. **$250,000.**

Wash., Chehalis—HOSPITAL—Convent of St. Rose, Everett, St. Helen's hospital addn. **$364,170.**

●**Wash., Seattle**—HOME—Norse Home, Inc., c/o Ralph T. W. Buechmann, 1600 14 Ave. N., plans by E. Mahlum, 1305 Republican St., 5 story, bsmt., rein.-con. Home for Aged. **$1,000,000.**

Wis., Rice Lake—HOSPITAL—St. Joseph's Hospital, Rice Lake, hospital. **$360,000.**

N. S., Sydney—HOTEL—Community Hotel Co., Dorchester St., 60 double-room hotel addn. Approx. **$750,000.**

Que., St. Laurent—HOUSING—Co-operative d'Habitation Laurentienne de Villa, plans by M. Legere, 255 Monkland Blvd., 50 to 100 housing units Approx. **$450,000-$900,000.**

INDUSTRIAL BUILDINGS

Calif., Burlingame — PLANT — Coca-Cola Bottling Co., Hayward bottling plant. **$140,000.**

Fla., Madison — WAREHOUSE, etc. — Tri-County Electric Co-operative, Madison, plans by Dennis & Dennis, Richard V. Richard, Assoc., C & S National Bank Bldg., Albany, Ga., warehouse and office. **$100,000.**

Ind., Gary—BAKERY—Continental Baking Co., 2160 W. 19 St., plans by Smith Brubaker & Egan, 30 N. LaSalle St., Chicago, 2 Ill., 2 story, bsmnt., rein.-con. brick bakery addn. **$100,000.**

Mo., St. Louis County—PLANT—Laclede-Christy Co., Donald N. Watkins, pres., 411 N. 7 St., St. Louis, Zone 1, plant incl. bldg., tunnel-kilns, equipment, etc. **$500,000.**

●**Mont., Polson**—MILL—Idaho-Montana Pulp & Paper Co., Polson, paper mill. **$2,500,030.** L. A. DeGuere, Wisconsin Rapids, Wis., engr.

Neb., West Point—HEADQUARTERS, etc.—Cuming County Rural Pub. Power Dist., West Point, plans by J. E. Lottus, Omaha Natl. Bank Bldg., Omaha, headquarters service, garage and office. **$160,000.** Henningson Eng. Co., Standard Oil Bldg., Omaha, consult. engrs.

●**N. Y., Newburgh**—STEAM PLANT—Central Hudson Gas & Electric Corp., South Ave., Poughkeepsie, steam plant to generate 60,000 kw. electricity at Dannskammer Point. **$12,000,000-$13,000,000.** Burns & Roe, 233 Broadway, New York, Zone 7, engrs. CD 3/11.

●**N. Y., New York**—GARAGE—New York Life Insurance Co., 51 Madison Ave., 2 story garage, on block bounded by Second Ave., E. 64 St., Third Ave., and E. 65 St. **$4,000,000.**

N. C., Carthage—TEXTILE PLANT—Owner c/o Wilton Brow, pres., Carthage, Textile plant. **$400,000.**

●**N. C., Lexington**—PLANT—Frank Ix & Sons, 1441 Broadway, New York, N. Y., rayon weaving plant. **$1,000,000.**

●**O., Albany**—GAS BOOSTER STATION—Tennessee Gas Transmission Co., Commerce Bldg., Houston, Tex., gas booster station. **$1,000,000.**

O., Chillicothe—POWER SUB STATION—Columbus & Southern Ohio Electric Co., 215 N. Front St., Columbus, power substation near Scioto River between Brownell and Watts St., extended. **$500,000.**

O., Hamilton—PLANT—American Cyanamid Corp., 30 Rockefeller Plaza, New York, N. Y., sulphuric acid plant, concrete fdn., steel towers, etc. **$150,000.** A. E. Hecker, c/o owner, consult. engr.

O., Cleveland — WAREHOUSE — Standard Drug Co., 408 St. Clair Ave., plans by Austin Co., engrs. and archts., 16112 Euclid Ave., East Cleveland, 3 story, bsmnt, 50,000 sq. ft., brick, steel warehouse adjacent to present bldg.

Pa., Phila.—BAKERY and STORE—Owner c/o Frank Green, archt., 8330 Germantown Ave., bakery and store. **$150,000.**

Tenn., Athens—PLANING MILL—Riggs-Buttram Lumber Co., Athens, rebuilding planing mill. **$100,000.**

●**Tex., Houston**—PIPE MILL—Consolidated Western Steel Corp., c/o U. S. Steel Corp., 2087 E. Slauson St., Los Angeles, Calif., 100,000 ton electric-welded steel pipemill, 78 acre tract off Clinton Dr. and ship channel, **$4,000,000;** dirt work, grading, drainage, levelling, water, sewer, gas, electric systems, **$1,000,000.**

Tex., Houston—SERVICE STATION—H. A. Potter & Ed C. Cronin, M. Esperson Bldg., masonry service station. **$150,000.**

Alta., Lethbridge—WAREHOUSE—Vergane Ltd., 10130 15 St., Edmonton, 125x125 ft., concrete, brick warehouse. **$100,000.**

UNCLASSIFIED

Calif., Burney—FISH HATCHERY—State Div. Architecture, P. Wks. Bldg., Sacramento, plans by Wm. Koblick, 2203 13 St., Sacramento, fish hatchery Crystal Lake. **$100,000.**

Calif., Huntington Beach—PIER—City, repairing municipal pier, **$100,000.** Harry A. Overmyer, city engr.

Calif., Los Angeles—STREET LIGHTING—Los Angeles Co., 501 Hall of Records, street lighting sys. in Elva Ave., Willowbrook, C. I. 1292. **$110,200.** C. E. Arnold, co. engr.

Calif., Stockton — GRANDSTAND, etc. — State Div. Architecture, P. Wks. Bldg., Sacramento, plans by Frank V. Mayo & Eric Johnson, 208 Exchange Bldg., grandstand and exhibit bldg. for 2nd District Agricultural Assn. **$500,000.**

Calif., Woodland—EXHIBIT BUILDING—State Div. Architecture, P. Wks. Bldg., Sacramento, plans by Barovetto & Thomas, 2809 I St., Sacramento, exhibit bldg. for 40th District Agricultural Assn. **$115,000.**

Maryland—PARK and BEACH DEVELOPMENT—State, Dpt. P. Imprvts., 200 W. Franklin St., Baltimore, park and beach development incl. 1½ mi. beach, 628 acres property, incl. 4 parking areas, utilities, recreation areas, sanitary, picnic grounds, bathhouses, game areas, diving piers, boating center, canoe, basin, diving tower, recreation and manor house, Sandy Point, Anne Arundel Co. Andrews & Clark, 305 E. 63 St., New York, N. Y., engrs.

●**Mass., Boston**—TERMINAL—Port of Boston Auth., Commonwealth Pier 5, South Boston, reconstruct Boston and Albany Terminal, Pier 2, East Boston. **$7,500,000.** Fay-Spofford & Thorndike, 11 Beacon St., consult. engrs. W. F. Donovan, 284 Park Square Bldg., staff engr. CD 3/21/46.

Minnesota — RURAL DISTRIBUTION LINES—Itasca-Mantrap Co-operative Electric Assoc., Park Rapids, 44 mi. rural distri. lines and sys. imprvs., Hubbard Co. **$270,000.**

Minn., Minneapolis — FIELD IMPROVEMENTS—City, Bd. Park Comrs., C. E. Doell, secy. and city supt., imprv. Stewart Field, 27 St. and 12 Ave. S. **$100,000.** E. Braddock, engr.

Minn., Minneapolis—SWIMMING POOL, etc. —City, Bd. Park Comrs., C. E. Doell, secy. and supt., City Hall, swimming pool and park near Northeast Athletic Field, 16 Ave. and Johnson St., area inclosed by 13 and 19 Aves. NE and between Johnson and Arthur Sts. NE. **$250,000.** E. Braddock, engr.

●**New Mexico** — RURAL DISTRIBUTION LINES—Jemez Mountains Electric Co-operative, Inc., San Ysidro, rural distr. lines and facilities, San Ysidro. **$3,975,000.**

New Mexico — RURAL DISTRIBUTION LINES—Northern Rio Arriba Electric Co-operative, Inc., Chama, rural distr. lines, Rio Arriba Co. **$710,000.**

†**N. M., Los Alamos**—TUNNEL, etc.—U. S. Atomic Energy Comn., P.O. Box 1539, tunnel and access road, 5 mi. 20 ft. wide, gravel surfaced road, concrete lining 4,500 ft. tunnel, 16 ft. diam. through mountain, Inv. No. 291-50-27. Approx. **$800,000.**

North Dakota—RURAL DISTRIBUTION LINES—Capital Electric Co-operative, Bismarck, 334 mi. rural distr. lines, Burliegh Co. **$140,000.** Ulteig Eng. Corp., 1114½ Front St., Fargo, consult. engrs.

O., Cleveland—PARK—City, City Hall, Lakeside and E 9 Sts., bond election Nov. 8, imprv. Brookside Garfield Wade Park, Rockefeller, Edgewater and various other parks. **$1,500,000.** CD 6/1/44 and CD 4/8/46.

S. C., Columbia—SWIMMING POOL—City, City Hall, 1737 Main St., swimming pool in Olympia area. **$200,000.**

Texas—OIL PIPELINE—Republic Pipe Line Co., Wilson Bldg., Corpus Christi, 40 mi. 4 in. crude oil pipeline from Susan Peak field in Tom Green Co. to near Eldorado. **$450,000.**

Tex., Dallas—RAILWAY TRACKAGE, etc. —Terminal Building Corp., 2nd unit of Santa Fe Bldg., laying railway trackage into 322 acre industrial plot. **$150,000;** gas lines, **$50,000.**

Tex., Houston—LIGHTING SYSTEM—City, City Hall, 900 Brazos St., sodium and mercury day and night lighting of Freeway Rd. sys. along Hy. 90 inside city limits. **$100,000.** L. Fugate, city engr.

Tex., Houston—STADIUM—Houston Independent School Dist., 1600 Washington St., 5,000 seating capacity stadium expans. **$300,000.**

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CONSTRUCTION REPORTS—Second Section

WATER SUPPLY

BIDS ASKED

November 3

Tex., Fort Worth—City, 48 in. water conduit from Lake Worth to Holly Plant, $250,000. Freese & Nichols, 407 Danciger Bldg., engrs. CD 2/4.

About November 10

Ark., Strong—City, City Clk., City Hall, water distr. sys., 50,000 gal. tank on tower, etc., $90,000. Extended date. Max A. Mehlburger, Pyramid Bldg., Little Rock, engrs. CD 9/16.

November 15

Calif., Laguna Beach — Laguna Beach Co. Water Dist., Laguna Beach, water distr. sys. and pump. plant, in Imprvt. Dist. 2, Arch Beach Heights, Approx. $28,000.

November 17

O., Mansfield—City, City Hall, water treatment plant, $500,000. Plans deposit $25. Jennings Lawrence Co., 12 N. 3 St., Columbus, engrs. CD 9/13/45.

LOW BIDDERS

Mass., Lee—Town Water Comrs., Town Hall, Oct. 7, watermain extension, South Lee, from George E. Duteau, 1125 Page Blvd., Springfield, $47,530. Leon H. Reed, 53 Daniels Ave., Pittsfield, engr.

Mo., St. Louis—City of St. Louis, Bd. P. Service, Frank J. McDevitt, pres., 304 City Hall, 12 and Market Sts., Zone 1, Oct. 11, cleaning, repairing, lining with cement mortar, 3,132 lin. ft. 49 in. Conduit 1, Forest Park, and 13,935 lin. ft. 36 in. steel watermain on May and Chippewa Sts., Broadway, Sulpnur, Hampton and Tamm Aves., from The Preload Corp., 311 E. 37 St., New York, N. Y., $64,590. Est. $70,000. CD 9/16.

Tex., Dallas—Dallas Park Cities Water Control & Imprvt. Dist. 2, c/o Bd. Directors, Highland Park, water treatment, from Morey & Morey, Praetorian Bldg., $76,800.

CONTRACTS AWARDED

Ark., Augusta—City, imprv. water sys., to Arkansas Constr. Co., El Dorado, $50,604. Bids 10/6.

Conn., Middletown—City, Samuel C. Cannon, comr. P. Wks., Middletown, 12 and 20 in. c. i. watermains, Stevens Lane, West and Pine Sts. to Wadsworth St., to Patsy Vernale, Main St., Approx. $28,000. Bids 9/14. CD 8/31.

Ill., Nashville—City, T. E. Allen, clk., City Hall, water treatment plant imprvs., own forces, $42,780. Bids 9/2. CD 8/12.

Ia., Council Bluffs—Bd. Water Works, WW imprvs., to Omega Machine Co., 9 Coddington St., Providence, R. I., $34,831. Bids 9/16. CD 8/31.

Me., Brewer—City, Water Dist., H. E. Rider, trustee, City Hall, concrete reservoir and standpipe pump. station equip., to T. W. Cunningham, Inc., 38 Columbia St., Bangor, $79,000. CD 5/16.

Md., LaPlata—Bd. Town Comrs., approx. 12,270 lin. ft. 6 and 8 in. c. i. watermains, approx. 19 fire hydrants, 28 valves, etc., to Nance & Vivadelli, 2420 Wilson Blvd., Arlington, Va., $43,658. Bids 9/2, awarded 9/22. CD 8/23.

Mo., Huntsville—City, water sys., asbestos cement water line, to Bates & Dungey, Sparta, Ill., $45,801; exten. water lines, to R. J. Hastings, 1135 81 St., St. Louis, $37,107. Bids 9/29. CD 9/2.

Tenn., Nashville—At office E. B. Smith, city purch. agt., City Hall, Zone 3, high service suction, low service discharge and appurtenances at water filtration plant and pump. station, to J. B. Michael & Co. Inc., P. O. Box 241, Crosstown Station, Memphis, $298,274. Est. $275,000. Bids 9/14, awarded 9/21. CD 8/5.

Tex., Corpus Christi—City, 16 in. watermains in W. Broadway Nueces Bay Bldg., Purchase and Hire, $92,000. CD 10/15/47.

Utah, Salt Lake City—City, c/o Irma Bitner, recdr., City and County Bldg., installing 6,350 lin. ft. 18 in. c.i. pipe from 1st North to 9th North on 8th West St., to Griffith, Gornall & Carman, 1057 South 4th West St., $20,018, materials by owner, $47,000. Bids 9/29. W. D. Beers, city engr. CD 5/24/44.

Wis., Fontana—Village, laying watermains, to Wm. J. O'Neil, Lake Geneva, $28,665. Bids 10/7. Jensen & Johnson, Williams Bay, engrs.

Ont., Fort Erie—Town, supplying watermains for North and South water sys., to Johns-Manville Co., Ltd., 199 Bay St., Toronto. Approx. $42,000. J. A. Bell, c/o owner, engr.

Que., Quebec City — Municipality, exten. watermains in Des Lilas St., and on street running parallel to Dorchester St., own forces, $58,000. Ed Hamel, city engr. CD 7/26/48.

SEWERS, WASTE DISPOSAL

BIDS ASKED

November 8

Mo., Clayton (St. Louis 5, P. O.)—City, Miss Charlee Niedner, clk., City Hal, 10 N. Bemiston St., 12-to 36-in vitr. clay and rein.-con., etc., Davis Place Storm Relief Sewers, $86,000; 12-to 36-in. vitr. clay and rein.-con. etc., Old Town Storm Relief Sewer, $77,000. Horner & Shifrin, 803 Shell Bldg., 1221 Locust St., St. Louis, Zone 3, engrs.

November 14

Calif., Concord — City, City Hall, sewage treatment and disposal plant. Approx. $50,000. Plans deposit $10. John S. Bates, 3134 Eton Ave., Berkeley, engr.

●**Ga., Atlanta**—City, incinerator plant addn., $1,250,000 with equip. Plans deposit $100. Extended date. Robert & Co. Assoc., Inc., 96 Poplar St., archts. CD 10/11.

N. Y., Freeport—Bd. Sewers Comrs., Municipal Bldg., 46 N. Ocean Ave., approx. 3,110 lin. ft. 8 in. sanitary sewers, with 5 in. house laterals to curb, manholes, appurtenant structures, Lateral Sewer Dist. 12. Plans deposit $25. Baldwin & Cornelius Co., Inc., 117 W. Sunrise Hy., engr.; adv. ENR 10/27. CD 3/25/46.

November 17

Ky., Louisville — Louisville and Jefferson County Metropolitan Sewer Dist., 414 W. Jefferson St., Zone 2, Central Relief Drain Extension South, Contr. 87. Plans deposit $50. Morris Forman, ch. engr. CD 11/15/45.

About November 29

†**Iowa** — U. S. Eng., 1709 Jackson Ave., Omaha, Neb., pumping station, sewer lines, appurtenances, Carter Lake, Pottawattamie Co., CIVENG 25-066-50-83.

LOW BIDDERS

Calif., Chowchilla—City, City Hall, Oct. 7, sewage treatment plant, from Idaho Constr. Co., Inc., 383 Thorne Ave., Fresno, $59,355. CD 11/30/45.

Calif., Santa Barbara—City, Oct. 13, sewage treatment plant, from Hermann Co., 417 S. Hill St., Los Angeles, $661,890. Est. $750,000. CD 9/30.

Conn., Hartford—City of Hartford, Metropolitan Dist., Bd. Contr. & Supply, 550 Main St., sewage plant, clearing, grading, Pitkin and Main Sts., East Hartford, from BMY Constr. Co., 752 Silas Deane Hy., Wethersfield, $124,266. CD 1/29/45.

Ind., Liberty—Bd. P. Wks., sewage treatment plant and sewage sys. from Shamrock Co., 2600 W. 9 St., Gary, $271,653. Est. $300,000. Henry B. Steeg & Assoc., 2331 N. Meridian St., Indianapolis, consult. engrs. CD 10/31/45.

Kan., Strong—City, Sept. 29, sewers, from Topeka Excavation Co., 1108 College St., Topeka, $70,000. CD 8/19.

Md., Hyattsville — Washington Suburban Sanitary Comm., Hanover St., Oct. 17, Contr. 659-S, approx. 12,000 ft. 10-to 24-in. plain concrete sewer, Hillcrest Heights Outfall sewer, Harnaby Branch from Southern Ave. to Lyons St., Oxon Dist., from Nance & Vivadelli, 2420 Wilson Blvd., Arlington, Va., $117,763. CD 10/13.

Md., Towson—Bd. Comrs. Baltimore Co., Court House, Contr. 174, storm drains, Nunnery Lane, near Catonsville, from Frank Angelozzi Constr. Co., 123 S. High St., Baltimore, $96,095. CD 10/6.

Mo., Sweet Springs—City, City Hall, Oct. 12, 33,500 ft. sewers, sewage treatment plant, from Storms-Frew Constr. Co., 1601 E. 37 St., Kansas City, Mo., $165,000. Est. $177,500. CD 10/5.

●**N. Y., New York**—Dpt. P. Wks., Municipal Bldg., Zone 7, Oct. 18, general contract, Hunts Point Sewage Treatment Works, from J. Rich Steers, Inc., 17 Battery Pl., Zone 4, Alt. A, $13,663,355, Alt. B, $13,577,355***electrical work from J. Livingston & Co., 101 Park Ave., Zone 17, $1,062,000***plumbing, from Edward R. Kearney Co., Inc., 143 E. 47 St., Zone 17, $69,950***heating and ventilating, from Kerby-Saunders, Inc., 630 W. 52 St., Zone 19, $153,360***Contr. 5, pumping units, from Worthington Pump & Mchy. Corp., 2 Park Ave., $268,720***Contr. 6, engines, generators and blowers, from Cooper-Bessemer Corp., 25 W. 43 St., Zone 18, $448,132. CD 10/11.

Pa., Abington—Abington Comrs., Abington, Oct. 11, sewers, Ardsley Sect., from A. Di Sandro, 937 Unruh St., Phila., $88,619. CD 9/20.

Tex., Cleveland—City, Oct. 11, sewage treatment plant, from A. S. Koehler, Shell Bldg., $97,645. CD 9/14.

Tex., Silsbee—City, Oct. 11, sanitary sewerage sys. extn. and imprvs., from Beaumont Constr. Co., P.O. Box 2814, Beaumont, $51,000, est. $65,000. CD 9/30.

CONTRACTS AWARDED

Conn., Putnam—City, Mayor Dempsey, City Hall, sanitary sewer in Cleveland, Dufault, Edmund, S. Main, Park and Arch Sts., to Consolidated Constr. Co., 57 Farmington Ave., Hartford, $50,597. Gilbert C. Perry, City Hall, city engr. CD 3/24.

Md., Salisbury — Mayor and City Council, City Hall, 125 ton garbage and refuse incinerator, to James H. Wood, Dover, Del., $261,000. CD 8/18.

N. D., Maddock—City, sewerage sys., to Barbarossa & Sons, 402 N. 33 St., St. Cloud, Minn., $83,983. Bids 8/30. CD 8/17.

Pa., Abington—Abington Comrs., Abington, sewers, North Hills, Sect., to A. Di Sandro, 937 Unruh St., Phila., $105,307. Bids 10/11. CD 9/20.

Tex., Houston—S. N. Adams, Oak Estates, 3713 Inwood Dr., storm sewers, adjacent to River Oaks, Tall Timbers sect. to Gaylord Constr. Co., 806 Blodgett St. Approx. $55,000; sanitary sewers, adjacent to River Oaks Tall Timbers sect., to Trimm Constr. Co., Pasadena, approx. $50,000. Howe & Wise, 4119 San Jacinto St., engrs.

Tex., Sweetwater — City, sanitary sewer, northwest sect. of city, force account. Approx. $80,000. Roy Duckett, city engr.

Va., Roanoke—City, Municipal Bldg., sanitary sewer projects, in recently annexed Hollins Rd. and part of Williamson Rd. sect., to Boyd & Goforth, Inc., Pineville Rd., Charlotte, N. C., $320,498. Bids 10/10. CD 9/13.

Ont., Fort Wellar—City of St. Catherines, H. H. Smith, city clk., sewage disposal plant, to Ontario Constr. Co., Ltd., Box 36, St. Catherines, Approx. $73,610. Bids 9/30. CD 9/20.

BRIDGES

BIDS ASKED

October 31

Connecticut—State Hy. Dpt., Hartford.

Chester—wid'n. 2 bridges over Great Brook, N. Main St.

Shelton—92 ft. span composite deck, welded steel girder bridge, to carry Shelton-Derby-Ansonia expressway over Coram Ave., Avenue Grade Readjustment at bridge, requiring 55-ft. bit. conc. surf.

November 4

Kentucky—State Hy. Dpt., Frankfort.

Jackson Co.—4 rein.-con. culverts, Little Sexton Creek Rd., from Clay Co. line, 6 mi. northeast of Sexton Creek, P. O. to Clay Co. line, I.17 mi. S. P. RS 55-229.

Logan Co.—bridge and traffic bound approaches over Elk Lick Creek, Rush Mill Rd., approx. 0.6 mi. south of Ky. 106. Plans deposit $10 each.

November 8

Oklahoma—State Hy. Dpt., Oklahoma City.

Cotton Co.—4 concrete, steel bridges, U. S. 70, $43,891.

Tillman Co.—4 concrete, steel bridges, U. S. 70, $48,961. S. K. McClelland, state hy. engr.

November 10

California—State Div. Hys., 120 S. Spring St., Los Angeles, Los Angeles Co., 2 rein.-con. bridges for undercrossings on Harbor Freeway at 1 and 2 Sts. G. T. McCoy, Sacramento, state hy. engr.

LOW BIDDERS

Calif., Stockton—San Joaquin Co., Courthouse, Oct. 10, bridge over Middle River between Tower Jones Tract and Bacon Island, from H. F. Pattizen, Box 470, Pittsburg, $53,368. CD 10/4/46.

●**New York**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, Oct. 19, elimination of grade crossing of N. Y. C. R. R. with Erie St., West Seneca St., Church St. and Terrace in city of Buffalo, 2.54 mi. P. S. C. 5472, Erie Co., from C. B. Moon & Ferguson & Edmondson Co., 3424 Carnegie Ave., Cleveland, O., $4,104,022 est. $4,529,000; bldgs. and misc. work, P. S. C. 5472, Erie Co., from Mark Constr. Corp., Depew, $124,715 est. $125,000. CD 10/5.

●**Pennsylvania**—Pennsylvania Turnpike Comn., 11 N. 4 St., Harrisburg, Oct. 18, substructure of Brush Creek Viaduct, Sec. 31GF, Western Extens. of Turnpike, from point approx. 305 ft. west of the centerline of Brush Creek easterly 1,047 ft. to point approx. 740 ft. east of the centerline of Brush Creek, for approx. 0.2 mi. incl. excavation for abutments and land and creek piers, construct concrete substructures, Westmoreland Co., from Ferguson-Edmondson Co., Keystone Bldg., Pittsburgh, $354,150***grading, drainage, structures, paving 3.32 mi. Sect. 31F, Western Extens. of Pennsylvania Turnpike, from approx. 3,850 ft. west of L. R. 64232 easterly for 17,543 ft. to approx. 295 ft. west of the centerline of Brush Creek, Westmoreland Co., from D. W. Winkelman Co., Heffernan Bldg., Syracuse, N. Y., $1,363,477. CD 10/3.

Texas—State Hy. Comn., Austin, Oct. 18, railroad overpass, grading, surf. 4.932 mi. Hy. 121, Proj. F 1085 (7) and FG 1085 (3), Denton Co., from Uvalde Constr. Co., P. O. Box 3027, Dallas, and J. R. Clardy Constr. Co., P. O. Box 2024, Sylvania Sta., Fort Worth, $200,341. CD 9/29.

CONTRACTS AWARDED

West Virginia—State Rd. Comn., Charleston, open steel grating floor and repairs 640 ft. Bridgeport Bridge 16&7 over Back Channel of Ohio River, State Proj. 3803, Ohio Co., to Baker & Hickey Co., Morse Rd., Columbus, O., $211,303. Bids 9/27. CD 9/19.

Ont., Mimico—Canadian National Rys., E. R. Logie, ch. engr. (Central Region) 436 Union Station, Toronto, subways, 18 St. and Church St., to McNamara Constr. Co., Ltd., 42 Industrial St., Leaside, Approx. $100,000. Bids 8/29. CD 8/19.

STREETS AND ROADS

BIDS ASKED

October 31

Connecticut—State Hy. Dpt., Hartford,

Orange—2,989 lin. ft. rolled bank run gravel surf. Dogburn and Dogwood Rds.

November 1

Massachusetts—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,

Attleboro—hy. and bridge constr. F. A. SG 78(1).

Harvard-Littleton—hy. and bridge.

Wareham—hy. reconstr. Plans deposit $10.

November 4

Kentucky—State Hy. Dpt., Frankfort

Caldwell Co.—grade, drain, high type wid'n, 0.485 mi. Ky. 93 in Fredonia on Fredonia-Eddyville Rt. from Ky. 91 to L. C. R. R. crossing, S. P. 17-222.

reconstruction and traffic bound surf. 11.336 mi. Crestwell-Enon-Fredonia Rd., from K7 139 at Crestwell to Ky. 91 at Fredonia, RS 17-402.

Campbell Co.—reconstruction and traffic bound surf. 1.2 mi. Hornbeck Rd. from U. S. 27 0.5 mi. north of Pendleton Co. line, exten. southwest to Hissem Rd.

Graves Co.—reconstruction and traffic bound surf. 4.643 mi. Dublin-Ky. 58 Rd. from Ky. 384 one mile east of Dublin to Ky. 58 approx. 4.5 mi. southwest of Pryorsburg, RS 42064S.

Greenup Co.—reconstruction and traffic bound surf. 4.75 mi. Kehoe-Lowder School Rd., from Ky 7 to Kehoe to Lower Fork R., near Lowder School, S. P. RS 45-351.

Hardin Co.—traffic bound surf. 0.586 mi. Elizabethtown-Bardstown Rd., beginning approx. 2 mi. west of Nelson Co. line, exten. toward Elizabethtown, F 196 (6).

Knott Co.—reconstruction and traffic bound surf. 1.5 mi. Caney Creek Rd., from Ky 7 near Knott-Floyd Co. line, exten. southwesterly up Caney Creek, S. P. RS 60-258.

Knox Co.—reconstruction and traffic bound surf. 5.6 mi. Walker Memorial Mishman Springs Rd., from Swan Lake Post Office, extend. northwesterly to Ky. 6, 1 mi. west of Dishman Springs, S. P. RS 61-390.

Lawrence Co.—reconstruction and traffic bound surf. 5.6 mi. Cooksey Creek Rd., from Ky. 1 approx. 4 mi. southwest of U. S. 23 to cross road near top of mountain, S. P. RS 64-213.

Lyon Co.—traffic bound surf. 3.847 mi. Kuttawa-Princeton Rd. beginning near junction of Ky. 93 and exten. to Caldwell Co. line, S. P. S 168 (1).

Martin Co.—reconstruction and traffic bound surf. 5.1 mi. Turkey Creek Rockcastle Creek Rd., from rural highway near mouth of Turkey Creek to Ky. 3, 0.2 mi. west of county line, S. P. RS 80-121.

Meade Co.—traffic bound surf. 0.9 mi. Brandenburg-Louisville Rd., two disconnected sections, the first section beginning approx. 0.8 mi. east to Brandenburg, 0.9 mi. S. P. 82-23.

Muhlenberg Co.—reconstruction and traffic bound surf. 2.4 mi. Yeargins Chapel Vernal Grove Rd., from U. S. 62, 6.7 mi. west of Greenville, extend. southeasterly 2.4 mi. R. S. 89-583.

reconstruction and traffic bound surf. 2.31 mi. Clarks Mill Rd., from Ky. 189 near Bancroft, westerly 2.31 mi. S. P. RS 89-603.

reconstruction and traffic bound surf. 1.59 mi. Graham Rd. from Yeargins Chapel Rds. 2.4 mi. south of U. S. 62 to Clarks Mills Rds., 2.31 mi. west of Ky. 189, S. P. RS 89-503.

Nelson Co.—traffic bound surf. 5.573 mi. Bardstown-Springfield Rd., beginning approx. ½ mi. east of Bardstown and exten. to approx. ¾ mi. west of Beech Fork S. P. F 222 (2).

Ohio Co.—reconstruction and traffic bound surf. 8.85 mi. Sandefur Crossing Rd., from U. S. 62 to Baizetown-Rosine Rd., S. P. RS 92-424.

Whitley Co.—reconstruction and traffic bound bound surf. 7.83 mi. Meadow Creek Rd., from 0.85 mi. southeast of Ky. 26 at Woodline to Rockhole-Tyes Ferry Rd., S. P. SP 118-600.

reconstruction and traffic bound surf. 10.4 mi. Clio-Sanders Creek Rd., from U. S. 25W at Clio exten. west, south, southwest, northeast and east to intersection after making loop, S. P. RS 118-800. Plans deposit $10 each.

Minnesota—State Hy. Dpt., St. Paul.

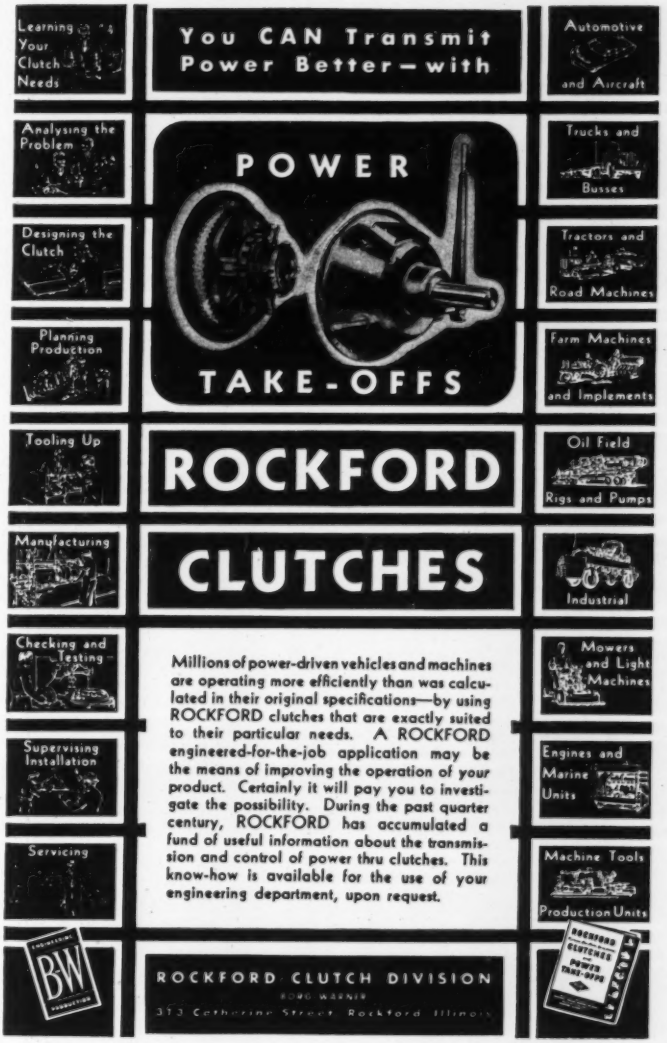
Ramsey Co.—bit. stabil. base 15.3 mi. between 2.5 mi. west of Rena and 1.6 mi. west of East Cass Co. line, S.P. 1102-03 (TH 2-8), Minn. Proj. F 289 (4). $250,000. Plans deposit $5.

Washington—State Hy. Dpt., Olympia,

Clallam Co.—surf. & stockpiling 10.6 mi. State Highways 9, 9-A and 9-B, Clallam Bay junction to Sappho.

Grant Co.—grading, drainage, surf. 2.073 mi. State Highways 2, 4-C and 19-B, Grand Coulee vicinity.

Lewis Co.—surf. stockpiling 5.47 mi. Primary State Highway 5, Mossy Rock to Riffe vicinity.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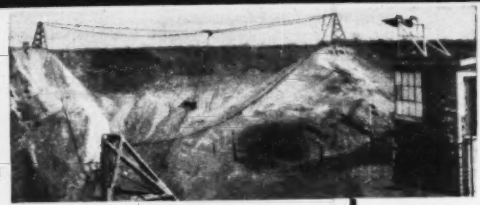

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Operator at scraper hoist has AUTOMATIC CONTROL of shifting tail end of machine, and instant spotting of scraper bucket wherever he wishes.

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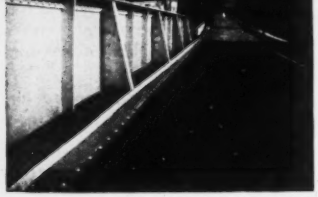

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Jacksonville, Fla. Norfolk, Va.
Eddington, Pa.

Snohomish Co.—Type I-1 ab. conc paving grounds at Everett maintenance headquarters. Plans deposit $2 each. W. A. Bugge, state hy. dir.

November 8

Oklahoma—State Hy. Dpt., Oklahoma City.
Cotton Co.—grading, drainage, minor structures 7 mi. U. S. 70. $128,335.
grading, drainage, minor structures, 2.787 mi. U. S. 70. $29,947.
Tillman Co.—traffic bound surf. 7.172 mi. U. S. 70, $91,662. S. K. McClelland, state hy. engr.

Tex., Pasadena—City, City Hall, c. conc. paving, black topping Center and Larkin Sts., etc. $100,000. George Smith, c/o owner, engr. CD 9/19, under LB.

November 10

California—State Div. Hys., 120 S. Spring St., Los Angeles,

San Bernardino and Riverside Counties—plant mix on cement treated surf. 9.6 mi. and existing surf., between 2.3 mi. east of Redlands and Beaumont.

San Diego Co.—plant mix on cement treated 6.5 mi. between north city limits of San Diego and Miramar. G. T. McCoy, Sacramento, state hy. engr. CD 10/20/48.

LOW BIDDERS

Mass., Boston—City, P. Wks. Dpt., City Hall Annex, Oct. 10, sheet asph. paving Washington St., etc., Roxbury, from Hancock Constr., 44 Fish Pier, $54,525. CD 9/30.

Texas—State Hy. Comn., Austin, Oct. 18, c. conc. paving, curb and gutter and storm sewers 0.294 mi. Hy. US 81 in Fort Worth. C 14-21-1, Tarrant Co., from Worth Constr. Co., P. O. Box 331, Fort Worth, $61,240***roadbed tr. flexible base and single asph. surf. tr. 7.93 mi. Hy. FM 1089, Brazoria Co., from Brittain & Gibbins, P. O. Box 7261, Fort Worth, $128,877***flexible base, double asph. surf. tr. 5.569 mi. Hy. FM 385, Proj. S. 1268 (1), Kimble Co. from Killian-Keller Co., P. O. Box 1981, San Antonio, $74,818***flexible base, single asph. surf. tr. 4.107 mi. Hy. FM 904, Delta and Hunt Counties, from L. W. Pelphrey Co., P. O. Box 1166, Gladewater, $98,602***flexible base, single asph. surf. tr. 8.074 mi. Hy FM 1608, Proj. S. 1323 (1), Liberty Co., from R. W. McKinney, P. O. Box 190, Sacroglochos, $126,850***grading, structures 15.092 mi. Hy. US 96, Proj. F 327 (8) and (9), Sabine and San Augustine Counties, from Wilbig Constr. Co., P. O. Box 5926, Dallas, $312,093***flexible base, double asph. surf. tr. 12.292 mi. Hy. FM 400, Proj. S 306 (3), Lubbock Co., from Strain & Brown, Inc., P. O. Box 1057, San Angelo, $99,889***flexible base, prime and single asph. surf. tr. 6.791 mi. Hy. FM 854, Proj. C. 1124-2-1, Cherokee Co., from Dow Adams, Kaufman, $69,640. CD 9/29.

Tex., Houston—City, City Hall, 1.62 mi. 7 in. c. conc. paving Buffalo Dr., Rissonnet to Westheimer Rd. only, from Gaylord Constr. Co., 806 Blodgett St., $87,225. CD 7/26.

Virginia—State Hy. Dpt., Richmond, Oct. 18, rein.-con. paving 7.16 mi. Route 17 and bridge across Sylvan Run, Stafford and Fauquier Counties, frm Boro. Eng. & Constr. Corp., Hampton, $498,180***1.61 mi. four-lane divided (part of which will be paralleling two-lane) north from the Augusta-Rockbridge line, U. S. Route 11, Augusta Co., from Echols Bros., Inc., Staunton, $183,961***macad. 0.94 mi. Route 302 in grounds of University of Virginia, Albemarle Co., from S. L. Williamson Co., Inc., Charlottesville, $73,104***macad. 0.57 mi. U. S. Route 501, south of Buena Vista to eliminate a severe reverse curve at Camden Creek, Rockbridge Co., from B. D. Gentry Constr. Co., Walnut Cove, N. C., $79,865. CD 10/4.

Washington—Bureau Public Roads, General Services Admin., Morgan Bldg., Portland, Ore., Oct. 13, bit. surf. ¼ mi. Mt. Baker Hy., Whatcom Co., from C. V. Wilder, Bellingham, $78,190. CD 10/6.

West Virginia—State Road Comn., Charleston, Sept. 8, traffic bound 4.507 mi. Bull Run-Hannahsville Rd., Proj. 7659, Tucker Co., from Keeley Constr. Co., Clarksburg, $220,698. CD 8/31.

Ont., Toronto—City, H. E. McCallum, mayor, b. conc. Clifton Rd. from 250 ft. north of South Dr. to Roxboro St. west to Clifton Rd., from Rayner Constr., Ltd., 29 Commercial Rd., Leaside, Approx. $54,644. CD 9/15.

CONTRACTS AWARDED

Fla., Cedar Keys—Rd. Comrs., Levey Co., Cedar Keys, road from Cedar Keys to Island Airport, incl. causeways and small bridges to James H. Craggs Constr. Co., Ocala, Approx. $50,000. L. M. White, Bronson, engr.

Idaho—State Hy. Dpt., Boise, surf. 6.959 mi. Cottonwood Greencreek Rd., Idaho Co., to F. H. DeAtley, Lewiston, $62,190. Awarded 10/10.

Ill., Chicago—City Dpt. Purchases, City Hall, Sept. 22, road improvs., W. Washington to W. Randolph Sts., Section 1212.2 Wacker Dr. exten. to Herlihy Mid-Continent Co., 79 W. Monroe St., $1,052,383. CD 9/27, under LB.

Neb. Lincoln—City, City Hall, resurf. O St. to Abel Constr. Co., 895 N. 15 St., $51,256. CD 8/29.

Neb., Syracuse—City, street imprvs., to Peter Kiewit Sons Co., Omaha Natl. Bank, Omaha, $56,000. Bids 10/3. CD 9/28.

New Hampshire—State Hy. Dpt., Concord, bit. macad. paving 3.029 mi. and a bridge, an approach to the Seacoast Toll Rd. for N. H. Route 16 in towns of Newington and Portsmouth, Rockingham Co., to R. G. Watkins & Son, Inc., Mill Yard, Amesbury, Mass., **$455,227.** Bids 10/17, awarded 10/18. CD 9/20.

N. J., Gloucester—Bd. Freeholders, Gloucester Co., Woodbury resurf. various roads, to E. R. Moorehouse, 1400 Pine St., Camden. **$58,032.** William H. Baum, co. engr.

●**New York**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, construct 5.91 mi. Mohawk Thruway, exten. eastward from Thompson Rd. in Onondaga Co. to Chittenango Creek, Madison Co., to Savin Constr. Corp., 10 Village St., East Hartford, Conn., **$1,313,553.** Bids 9/14. CD 9/19, under LB.

Tex., Gladewater—City, asph. street paving and imprvs., force account, **$69,000.**

Tex., Houston—S. N. Adams, Oak Estates, 3713 Inwood Dr., asph. paving adjacent to River Oaks Tall Timbers sect., to Gaylord Constr. Co., 806 Blodgett St., **$53,300.** Howe & Wise, 4119 San Jacinto St., engrs.

West Virginia—State Rd. Comm., Charleston, traffic bound 3.78 mi. Randolph Co. Line-Mace Rd., (Sec. 219/2), State Secondary Proj. 7355, Pocahontas Co., and traffic bound 2.9 mi. Pocahontas Co. Line-Chimney Rock Run Rd. (Sec. 60) State Secondary Proj. 6698, Randolph Co., to Keeley Constr. Co., Clarksburg, **$142,116** and **$87,289** respectively***traffic bound and bridge 0.793 mi. Springton-Matoaka Rd. F-308 (2), Mercer Co., to Acme Constr. Co., Beckley, **$265,531*****traffic bound and bridge 2.22 mi. end of Proj. S-519 (1), Headsville Rd., Proj. S-519(2) Mineral Co., to Stickley Bros., Inc., Keyser, **$57,625*****traffic bound 3.381 mi. Moxer-Grant Co. Line Rd., Proj. 6653 Pendleton Co., to Harman Bros., Grafton **$64,852*****traffic bound 7.52 mi. Secondary Route 11-Bee Rd., Projs. 5378 and 7241, Putnam Co., to Oldam Constr. Co., Huntington **$128,165*****traffic bound 1.479 mi. Indian-Mills-Stinking Lick Creek Rd., Proj. 7236 C, Summers Co., to Howard Price & Co., Huntington, **$53,357.** Grand total **$798,965.** Bids 9/8, awarded 10/5. CD 8/31.

EARTHWORK, WATERWAYS

BIDS ASKED

November 1

†**Arkansas**—U. S. Eng., P. O. Box 97, Memphis 1, Tenn., placing approx. 220,000 cu. yd. earthwork in turnover levee and ditch enlargement, Item R-184-SPR, Greene and Craighead Counties, Inv. Serial No. CIVENG-49-041-50-59. Extended date. CD 10/11.

●**Que., Montreal**—National Harbour Bd., engr., West lock, Ottawa, Ont., harbour imprvs., for Government of Canada, Hunter Bldg., Ottawa, Ont. $1,000,000. Plans deposit $100.

November 3

†**Tennessee**—U. S. Eng., P. O. Box 97, Memphis, Zone 1, placing approx. 1,100 cu. yd. riprap paving and rearranging approx. 250 cu. yd. riprap paving on landward portion of two willow mattresses, exten. above the water's edge, on left bank of Mississippi River on President's Island, in Memphis, Shelby Co., at approx. river mile 731 AHP, Inv. Serial No. CIVENG-49-041-50-52.

†**Washington**—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., aluminum crest railings with lighting for Grand Coulee Dam, Columbia Basin Proj., Spec. 2806. Extended date. L. N. McClellan, ch. engr. CD 10/5, under Public Bldgs.

November 7

†**New York and New Jersey**—U. S. Eng., 120 Wall St., New York, 5, N. Y., dredging approx. 539,200 cu. yd. all material except ledge rock from New York-New Jersey Channels, Sect. 3, Areas 1 to 4, Serial No. CIVENG-30-075-50-5. CD 8/19, under LB.

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DENSE - DURABLE - HIGH STRENGTH

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Up to 2" pipe through ordinary soil. Drives under highways, abutments, lawns, etc. without excavating. No delay coupling added lengths; no burred pipe ends.

NO TRENCHING, BACKFILLING OR SURFACING.

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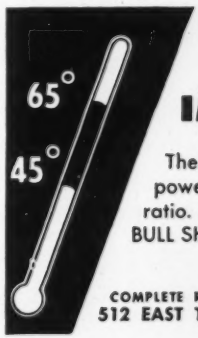

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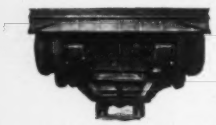

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Garden City 7-5451

November 8

†Arkansas—U. S. Eng., 300 Broadway, Little Rock, emergency levee repair, Faulkner County Levee Dist. 1, 70,000 cu. yd. set-back levee on left bank, Arkansas River, Faulkner Co., Inv. CIVENG-03-050-50-37.

November 9

†North Dakota—U. S. Eng., 1217 U. S. Post Office & Custom House, St. Paul 1, Minn., reservoir clearing, Stage 2, Baldhill Reservoir, Sheyenne River Serial No. CIVENG-21-018-50-15. CD 10/14.

About November 10

†Minnesota—U. S. Eng., 1217 U. S. P. O. and Custom House, St. Paul, Zone 1, clearing, grading and furnishing, placing gravel backing and riprap on graded slope, right bank of main channel, Mississippi River, Red Wing, riverward of small-boat harbor.

On or About November 22

†Georgia—U. S. Eng., P. O. Box 1169, Mobile 7, Ala., sub-impounding dam across Proctor Creek near Acworth, Cobb Co., CIVENG-01-076-50-31.

About November 27

†West Virginia—U. S. Eng., Madison Ave. and 8 St. W., Huntington, Zone 18, signal lines for water level recorders for Bluestone Dam, Bluestone Reservoir Proj., New River, Serial No. CIVENG 46-022-50-40.

On or About December 13

†Alabama—U. S. Eng., P. O. Box 1169, Mobile, Zone 7, overburden excavation and access road for Demopolis Lock and Dam, Demopolis, Marengo Co., Serial No. CIVENG-01-076-50-8. CD 11/24/43.

LOW BIDDERS

†Maryland—U. S. Eng., P. O. Box 1715, Baltimore, Zone 3, Oct. 12, maintenance dredging, Susquehanna River above and below Havre de Grace, Hartford Co.; Chester River, Kent Island near Narrows, Queen Annes Co.; Broad Creek, north Crisfield, Somerset Co.; Twitch Cove and Big Thoroughfare River, Somerset Co.; Paris Creek and West River below Annapolis, Anne Arundel Co., from Atkinson Dredging Co., Great Bridge, Va., **$41,139.** CD 9/16.

†Missouri—U. S. Eng., 826 U. S. Court House & Custom House, 1114 Market St., St. Louis, Zone 1, Oct. 12, 1,200 ft. Kaskaskia Island Bank Protection, Mississippi River, Serial No. CIVENG-23-065-50-22, from Massman Constr. Co., 20 W. 9 St., Kansas City, Mo., **$71,125.** CD 10/4.

N. H. Claremont—City, City Managers Office, City Hall, Oct. 7, raising White Water Brook Dam, from Frank W. Whitcomb, Walpole, **$50,723.**

†South Carolina—U. S. Eng., Customhouse, Charleston, rejected bids Oct. 5, maintenance dredging, Ashley River, CIVENG-38-081-50-4. Will re-advertise. CD 9/21.

CONTRACTS AWARDED

†Mississippi and Arkansas—U. S. Eng., P. O. Box 97, Memphis, Tenn., Oct. 11, minor repairs to revetment paving, banks of Mississippi River, between Memphis, Tenn. (Mile 732 AHP) and Hopefield, Ark. (Mile 600 AHP), Serial No. CIVENG-40-041-50-45, to Forcum-James Co., Dyersburg, Tenn., **$47,050.** CD 10/5.

O., Kenton—Hardin Co., Kenton, 31 mi. Hog Creek drainage ditch in northwestern Hardin Co., to Youngs Constr. Co., Petersburg, Ind., **$143,700.** Est. $224,779. Kohls & Kaliher, Domestic Bldg., Lima, engrs. Bids 9/28, awarded 10/13. CD 9/21.

Pa., York—City Council, City Hall, rein.-con. culvert 10 ft. high, 8½ ft. wide inside by 1,070 ft. long for extens. Poor House Run Flood Control Proj., to J. Richard Nissley, Landisville, **$363,978.** Bids 9/30, awarded 10/14. CD 8/23.

†Washington—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, Oct. 14, levee restoration along Yakima and Naches Rivers, Serial No. CIVENG 45-108-50-23 to Carl M. Halvorson, Couch Bldg., Portland, Ore., **$38,297.** Est. $41,623.

B. C., Kamloops — Canadian Commercial Corp., 70 Lyon St., Ottawa, Ont., river bank protective measure at No. 15 "X" Depot, to British Columbia Bridge & Dredging Co., 544 Home St., Vancouver, Approx. **$82,240.** CD 12/15/43.

Nova Scotia—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., dredging in Bridgewater, La Have R. and Caribou, to J. P. Porter Co. Ltd., 1010 St. Catherines St. W., Montreal, Que., Approx. **$146,371.**

AIRPORTS AND AIRBASES

BIDS ASKED

On or About December 9

†S. D., Rapid City—SHOP—U. S. Eng., 1709 Jackson St., Omaha, 2, Neb., shop addn. to HB Hangar, Rapid City Air Force Base, Weaver, Pennington Co., Spec. 23-066-50-81. CD 10/26.

PUBLIC BUILDINGS

BIDS ASKED

November 1

Conn., Wallingford—SCHOOL—Town, A. C. Prisk, chn. Bldg. Comn., Wallingford, 2

story, bsmnt., brick, steel school, N. Main St. $300,000 Carl J. Malmfeldt Assoc., 36 Pearl St., Hartford, archts. CD 10/17.

Wis., Dodgeville—HOSPITAL—St. Joseph's Hospital, Dodgeville, 4 story, bsmnt., 40x105 ft., concrete, brick tile hospital addn. $200,000. E. Brielmaier & Sons, 735 N. Water St., Milwaukee, Zone 2, archts. CD 2/14/45.

Ont., Cornwall—HIGH SCHOOL—J. Martin, secy. Bd. Trustees, Suburban Cornwall High School Area, Cornwall, 18 classrooms, and 8 other room high school, gymnasium, auditorium, McConnell and Second Sts. Approx. $615,000. Plans deposit $25. H. Roberts, Westport, archt. CD 2/18.

After November 1

Mo., Sedalia—SCHOOL—Bd. Educ., School Dist. 200, Pettis Co., c/o Secretary, Sedalia, cafeteria, gymnasium, etc., addn. to Smith-Cotter High School; auditorium-gymnasium and class room addn., alterations to Whittier, Horace Mann and Broadway Schools and the C. C. Hubbard High School, $300,000. Wm. B. Ittner, Inc., 408 Bd. Educ. Bldg., 911 Locust St., Louis, Zone 1, archt. CD 5/14/46.

November 2

●Pa., Harrisburg — HOSPITAL — Polyclinic Hospital, 3 St. and Polyclinic Ave., general contract, heating, plumbing, electrical work and elevators for annex, bldg. to hospital, $2,792,220. Plans deposit $50. Extended date. Lawrie & Green, 321 N. Front St., Harrisburg, archts. CD 9/30, under Commercial Bldgs.

November 3

●Mass., Cambridge — HOUSING — City of Cambridge Housing Auth., 1416 Mass. Ave., six 3 story, and one 8 story bldgs., 228 unit veterans housing Proj. 200-4, Cambridge and Windsor Sts. Approx. $2,250,000. Plans deposit $50. R. D. Kimball Co., 6 Beacon St., Boston, engr. CD 9/30.

Okla., Woodward — HOSPITAL — At office Mary Clift, city clk., Woodward, municipal hospital and equip. $275,000. Plans deposit $25. J. R. Koberling, Tri-State Bldg., Tulsa, archt. CD 10/13/48.

November 4

†D. C., Wash.—RADIO BUILDING—Public Bldgs. Admin., General Services Bldg., altering east end Radio Building No. 10, Proj. 49-143 Plans deposit $5.

Pa., Linfield — SCHOOL — Limerick Twp. School Bd., Linfield, school. $300,000. W. Marshall Hughes, 1015 Lancaster Ave., Reading, archt.

November 7

†N. J., North Bergen—POST OFFICE—Public Bldgs. Admin., 731 Custom House, New York 4, N. Y., misc. repairs to post office. **FWA.**

Va., Richmond—SCHOOL—City, Richmond, Helen Dickinson School alterations and adns. $375,000. Plans deposit $15. Baskervill & Son, 2313 West Cary St., archts.

November 8

●Ia., Mt. Pleasant — HOSPITAL — State Bd. Control, Des Moines, patient bldg., Mt. Pleasant State Hospital, $1,353,202. CD 8/12/48.

Md., Upper Marlboro — SCHOOL — Prince Georges Co. Bd. Educ., Upper Marlboro, Suitland Junior High School, Silver Hill Rd., Suitland, Paul Kea Assoc., Professional Bldg., Hyattsville, archts.

†Tennessee — HOUSING, etc. — U. S. Eng., U. S. Courthouse, P. O. Box 1070, Nashville, Zone 1, Dale Hollow permanent housing and comfort station. Serial No. CIVENG-40-058-50-13. CD 10/11.

November 9

Calif., Hemet—SHOP—Hemet Union High School Dist., Hemet, steel frame shop, $100,000. Bowen, Rule, Bowen, 2835 Gilroy St., Los Angeles, archts. CD 9/2.

†N. J., Madison—POST OFFICE—Public Bldg. Admin., 731 Custom House, New York, 4, N. Y., misc. repairs to post office. **FWA.**

†N. M., Las Cruces—OFFICERS QUARTERS, etc.—U. S. Eng., P. O. Box 1538, Albuquerque, single officers quarters and paint and oil storage bldg., Serial No. ENG 29-005-50-6. Approx. $250,000. Extended date. CD 9/13.

N. Y., New York—HOUSING IMPROVS.—New York City Housing Auth., 63 Park Row, Zone 7, concrete pavement for walks at Vladeck Houses, Proj. No. NY 5-3 and Proj. No. NYC 5-1, Manhattan Boro.

B. C., Abbotsford—POST OFFICE—J. M. Somerville, secy. Dpt. P Wks., Hunter Bldg., Ottawa, Ont., dominion public bldg. (post office). Approx. $250,000. Plans deposit $50. G. Brault, c/o owner, engr.

November 14

N. Y., Armonk—SCHOOL—Bd. Educ., Dist. No. 5 of North Castle, Armonk, school. Howard S. Patterson, 139 E. 53 St., New York, archt.

†N. Y., Oxford—POST OFFICE REPAIRS—Pub. Bldgs. Admin., 731 Custom House, New York, miscellaneous repairs to U. S. Post Office. **F.W.A.**

B. C., Vancouver—SCHOOL—H. F. Hines, secy. Vancouver School Bd., 590 Hamilton St., 2 story, full bsmnt., rein.-con. Douglas School addn., Approx. $400,000. Davies & McNab, 923 Denman St., archt. CD 9/28/43.

November 15

Kan. Dodge City — SCHOOL — Bd. Educ., A. G. Schroedermeier, clk. Dodge City, 1 story, 24,300 sq. ft., masonry school. $300,000. Mann & Co., P. O. Box 1148, Hutchinson, archts. and engrs.

N. J., Woodstown — SCHOOL — Pilesgrove Twp. School Bd., Woodstown, school addn. $300,000. Corcoran & Mills, 234 W. Market St., West Chester, Pa., archts. CD 6/17.

N. Y., Brooklyn—SCHOOL—Supt. School Bldgs., Design & Constr., 49 Flatbush Ave. exten., Zone 1, general contract plumbing and drainage, heating and ventilating, electrical and lighting fixtures for new P. S. 14, Avenue X and Brown St. Plans deposit $20 general constr.; $8, others.

†N. Y., Ticonderoga—POST OFFICE—Pub. Bldgs. Admin., 731 Custom House, New York, miscellaneous repairs to U. S. Post Office. **F.W.A.**

November 16

N. Y., Smithtown—SCHOOL—Bd. Educ., New York Ave., school, $638,000. Plans deposit $17. Daniel Perry, 1213 Main St., Port Jefferson, archt. CD 6/10.

November 22

†Fla., Orlando—LABORATORY—Yards & Docks, Navy Dpt., Pub. Wks. Bldg., Charleston, S. C., 1 and 2 story 92x104 ft., concrete laboratory, auxiliary bldgs., and utilities facilities at Underwater Sound Reference Laboratories, Spec. 21632. Plans deposit $60.

November 23

N. C., Winston-Salem—SCHOOL—Forsyth Co. Bd. Educ., R. W. Brimley, supt., Courthouse, Carver School. Plans deposit $50. Macklin & Stinson, Wachovia Bank Bldg., engrs, and archts.

November 29

Md., Upper Marlboro — SCHOOL — Prince Georges Co. Bd. Educ., Upper Marlboro, Fairmount Heights Negro High School addn., Reed St., Fairmount Heights.

Va., Farmville — AUDITORIUM, etc. — At office Dr Dabney S. Lancaster, pres. Longwood College, Farmville, auditorium and music bldg. for State of Virginia, Richmond. Approx. $500,000. Plans deposit $30. Stone & Thompson, 609 S. Jefferson St., Roanoke, archts. CD 3/17.

On or About December 1

†Oklahoma—POWER HOUSE and SWITCHYARD FACILITIES—U. S. Eng., P. O. Box 61, 2000 N. Memorial, Tulsa, Zone 2, powerhouse and switchyard facilities, Fort Gibson Dam, Cherokee Co., Grand (Neosho) River, approx. 5 mi. north of Fort Gibson, Serial No. CIVENG 34-066-50-50.

LOW BIDDERS

Calif., Bakersfield — SCHOOL — City School Dist., 1600 K St., Oct. 6, school, Potomac and King Sts., from C. J. B. Constr. Co., Box 329, Oxnard, **$339,500.** CD 9/19.

Calif., Spadra — LAUNDRY — State Div. Architecture, P. Wks. Bldg., Sacramento, Oct. 11, 95,000 sq. ft., rein.-con. laundry addn., from Stover Bros., Inc., Box 87, Claremont, **$90,977,** mechanical work from S. Glenn Hickman, 3170 E. 11 St., Los Angeles, **$77,900.** CD 9/21.

Calif., Stockton—SCHOOL—Stockton Unified School Dist., San Joaquin and Lindsay Sts., Oct. 11, 1 story, frame, stucco 9 classroom and office Edison High School Addn., from Nomellini Constr. Co., Box 542, **$296,549.** CD 9/13.

Colo., Denver—RESEARCH—University of Colorado Medical Center, c/o Bd. Regents, 4200 East 9 Ave., Denver, general contract 5 story, bsmnt., L-shaped 101 and 114x44 ft., cancer research hospital wing, from Brown-Scheperman & Co., 240 Washington St., **$359,979.** CD 9/13.

Conn., Branford—SCHOOLS—Town, School Bd., Branford, Oct. 6, brick, steel, 7 room Momauguin School and 4 room Short Beach School, from Gellatly Constr. Co., 181 Sylvan St., Bridgeport, **$317,965.** CD 9/27.

Conn., Bristol — SCHOOL — City, J. P. O'Connell, chn. Bd. Educ., Bristol, Oct. 5, 2 story, bsmnt. Mary A. Callen School addn., from Felix Buzzi & Son, 612 S. Main St., Torrington, **$397,000.** CD 9/21.

Fla., Winter Haven—SCHOOL—Polk County Bd. P. Instruction, Winter Haven, Oct. 13, school from A. & M. Constr. Co., Bartow, **$407,200.** CD 9/15.

Kan., Kansas City—CLINIC—University of Kansas Medical College, general contract Oct. 11, Eaton ward and clinic addn. to University of Kansas Medical College, from Wm. Rawlings, 1024 Forest Ave. **$364,619.**

Kan., Wichita — SCHOOL — Bd. Educ., L. E. Wilbur, secy.-treas., Administration Bldg., 428 S. Broadway, Zone 2, received no bids Sept. 20, brick, concrete intermediate school 17 and Volutsia Sts. **$260,000.** Will readvertise. CD 7/27.

Md., Towson — SCHOOL — Bd. Educ., Baltimore Co., Towson, postponed until 1950, (2nd unit) Loch Raven School, Loch Raven Blvd. **$300,000.** CD 9/14.

Md., Upper Marlboro — SCHOOL — Prince Georges Co. Bd. Educ., Oct. 11, 12 classroom school, Mt. Rainier-Brentwood School, Mt. Rainier, from Blake Constr. Co., 33 E. St. SW., Wash., D. C., **$286,448.**

†N. M., Los Alamos — BUILDINGS — U. S. Atomic Energy Comn., Los Alamos, Oct. 11, two Technical Buildings M-1 and K-1, Serial No. Inv. 291-50-16, from **D. W. Falls,** P. O. Box 885, Los Alamos, **$88,548.** CD 10/4.

†N. M., Las Cruces — SUPPLY and WAREHOUSE — U. S. Eng., Box 1538, Albuquerque, Oct. 6, supply and warehouse, White Sands Proving Grounds, NAV-910, Serial No. Eng-29-005-50-8 from Robert E. McKee, P. O. Drawer 562, El Paso, Tex., **$189,400.** CD 9/2.

N. Y., Beacon—HOSPITAL, etc.—Dpt. Correction, State Office Bldg., Albany, Oct. 13, general contract hospital addns., alterations, from Doria Constr. Co., Valhalla, **$340,500.** CD 10/3.

N. Y., New York — HOUSING — New York City Housing Auth., 63 Park Row, Zone 7, Oct. 11, general contract 7 buildings in Group 1 of Stephen Foster Houses Rehabilitation Proj. No. NYS-30, 2174 8 Ave.; 307 W. 114 St.; 309 W. 114 St.; 311 W. 117 St.; 251 W. 123 St.; 59 E. 118 St.; 18 E. 132 St., from V. B. Constr. Co., 737 Second Ave., Zone 16, **$366,649.** CD 10/6.

●N. Y., Rego Park—SCHOOL—Supt. School Buildings, Design & Constr., 49 Flatbush Ave. exten., Brooklyn, Zone 1, Oct. 18, general contract P. S. 175, 102 St. from 64 Rd. to 65 Ave., from T. G. K. Constr. Co. Inc., 55 W. 42 St., New York, Zone 18, **$1,146,200.** CD 9/26.

Okla., Perry — HOSPITAL — City, rejected bids Oct. 5, brick, concrete, steel 30 bed hospital. Est. **$300,000.** CD 9/27.

Ore., Portland — FIRE STATION — City, City Hall, Oct. 13, 3 story, concrete, steel central fire station with 6 story tower and bsmnt., from C. M. Corkum Co., 2630 S. W. 2 St., **$448,144.** CD 9/23.

Tex., Brownfield—HIGH SCHOOL — Brownfield Independent School Dist., Brownfield, Oct. 11, general contract high school, from James T. Taylor & Son, Box 225, Ft. Worth, **$353,366.** CD 9/19.

Tex., George West — SCHOOL — George West Independent School Dist., George West, school, gymnasium, from Davis Constr. Co., 3002 Dempsey St., Corpus Christi, **$259,600.** CD 5/5.

Tex., Houston — SCHOOL — Houston Independent School Dist., 1600 Washington St., Oct. 13, brick Wesleyan Road School, concrete slab fdn., from Charles R. Baum & Son, 307 Hughes St., **$267,774.** CD 9/26.

B. C., Surrey — SCHOOL — Surrey School Bd., Cloverdale, Oct. 6, 2 story, frame Junior-Senior High School, from Olund Bros., Mission, **$326,000.** CD 9/19.

CONTRACTS AWARDED

Calif., Los Angeles—WAREHOUSE—City, 3 story, 175x200 ft., rein.-con. warehouse, E. 7 St. Maintenance Yard, to Catalina Constr. Co., 1709 W. 8 St., **$243,854.** Bids 9/28, awarded 10/10. Ellis Wing Taylor, 803 W. 3 St., archt. S. B. Barnes, 803 W. 3 St., engr.

Calif., Santa Cruz — SCHOOL — Santa Cruz Elementary School Dist., 133 Mission St., Bayview School, to Orlo C. Hackbarth, 33 Magnolia St., **$263,000.** Bids 10/4. CD 9/2.

Conn., Milford—SCHOOL—Town, J. Foran, Supt. Schools, Milford, 1 and 2 story, 55x289 ft., brick, steel 13 classroom school, Kay Ave., to Monaca Constr. Co., 104 Reservoir Ave., Bridgeport **$352,000.** Est. $300,000. CD 9/14.

Ill., Chicago — SCHOOL — Bd. Educ., 228 N. La Salle St., Zone 1, 2 story, bsmnt., brick, stone, concrete, steel, school addn., 3740 N. Panama St., to Harvey A. Hanson, 1851 Elston St., Zone 14, **$250,000.** Awarded 10/3. John C. Christensen, 228 N. LaSalle St., archt.

Mich., Dundee — SCHOOL — Bd. Educ., 2 story addn. to Dundee Community School, to Giant Lumber & Bldg. Co., 1626 Ketcham Ave., Toledo, O. **$250,434.** Awarded 10/12. CD 10/3.

N. C., Smithfield — HOSPITAL — Johnston Memorial Hospital, Carl P. Worley, chn. bd., Smithfield, 100 bed hospital, to T. A. Loving Co., Goldsboro, **$581,485.** Bids 9/20. CD 9/26, under LB.

Tenn., Dyersburg — SCHOOL — Dyer Co., Dyersburg, consolidated school in Fowlkes community, to Cowan Lumber & Planing Mill, Co., 1419 Clinton St., Nashville, **$295,794.**

Va., Charlottesville—HEATING PLANT, etc. — At office Dr. Frank B. Stafford, supt. and medical dir. Blue Ridge Sanatorium, general contract central heating plant and steam distr. sys. for Blue Ridge Sanatorium, to Ivy Constr. Co., Charlottesville, **$78,596.** Bids 9/1, awarded 9/30. CD 8/1.

Va., Wytheville — HIGH SCHOOL — Bd. Educ., Wytheville, high school, to Clark Bros., Stuart, **$551,990.** Bids 9/27. CD 10/4, under LB.

W. Va., Williamstown—GYMNASIUM, etc.—Bd. Educ., Wood Co., Parkersburg, general contract 1 story, bsmnt., 99x155 ft., brick, steel gymnasium and auditorium, concrete slab floor and steel truss roof, to Moyer Bros., 14 Goshorn St., Charleston. Approx. **$328,000.** Bids 9/27. CD 9/22.

Wis., Waukesha — GARAGE, etc. — City, general contract 1 story 80x150 ft. and 28x116 ft. steel, concrete blocks garage and storage bldg., concrete fdn. and floors to Hunzinger Constr. Co., 4541 N. 124 St., Milwaukee, Zone 13, **$69,050.** Bids 10/10. CD 9/28.

N. S., Kentville—DORMITORY—Dpt. Hys. & P. Wks., Hon. M. D. Rading, minister, Halifax, dormitory addn. to Nova Scotia Sanatorium, to Acadia Constr. Co., Ltd., Dufferin St., Bridgewater. Approx. **$300,000.** Bids 9/28. CD 9/19.

Ont., Gravenhurst—SCHOOL—Bd. Educ., W. T. A. Scott, secy., high school, to Hill-Clark-Francis Ltd., Whitehead Ave., New Liskeard. Approx. **$725,000.** S. B. Coon & Son, 4 St. Thomas St., Toronto, archts. Bids 10/14. CD 9/28.

Ont., Waterford — SCHOOL — High School Bd., W. Hevitt, secy., Waterford, 2 story, L-shaped, rein.-con., steel, brick high school addn., to James Kemp Constr., 121 Vansitmart St., Hamilton. Approx. **$250,000.** Bids 9/30. CD 9/20.

Que., Lachute—GARAGE—Dpt. Roads, Quebec City, 1 story, 35x100 ft., brick, block, steel garage, concrete fdn., to Omer Laurin et Fils, 75 Bethany Rd., Quebec City. Approx. **$85,000.** E. Gohier, c/o owner, engr.

●**Que., Montreal**—FREIGHT SHEDS—Canadian National Rys., R. Wheelwright, ch. engr., 360 McGill St., freight shed development, to J. S. Newson Ltd., 660 Ste. Catherine St. W., **$1,550,000.** Bids 9/8. CD 8/24.

Sask., Lloydminster—HOSPITAL—Hospital Bd., Lloydminster hospital, to C. M. Miners Constr. Co., 615 Main St., Saskatoon, Approx. **$310,000.** Bids 8/25. CD 8/12.

COMMERCIAL BUILDINGS

BIDS ASKED

November 4

D. C., Wash.—OFFICE—American Legion, Headquarters Bldg., 777 Meridan Ave., Indianapolis, Ind., office, $700,000. Gieseke Kuehne & Brooks, 121 E. 8 St., Austin, Tex., archts. Marshall & Gongwer, 1147 Connecticut Ave. N. W., Wash., D. C., engrs. CD 9/23.

Pa., Phila. — OFFICE, etc. — International Ladies Garment Workers Union c/o M. Herbert Syme Esq., Market St. Natl. Bank Bldg., office and clinic. $350,000. James M. Clark Jr., 843 N. 19 St., archts.

●**Pa., Lansdowne** — APARTMENT—Wildman Arms Apartments, 86 W. Baltimore Ave., apartment development, Baltimore Ave., Est. $2,500,000. Former bids rejected. Dorfman & Bloom, Architects Bldg., Phila., archts. CD 8/18.

November 8

Tex., Waco — EDUCATIONAL — Columbus Ave. Baptist Church, Waco, 3 story, bsmnt., educational bldg. $350,000. Extended date. W. Cocke Jr. & Co., 1507 Franklin St., archts. Frank Drought, 117 W. Pecan St., structural engr. H. B. Wells, Dallas, mechanical engr. CD 10/11.

November 30

Ga., Fort Benning—HOUSING—Commanding General, Fort Benning, construction, financing and management by private enterprise 600 family housing units on Fort Benning Military Reservation.

December 20

La., New Orleans — INTERNES — Charity Hospital of Louisiana, 1532 Tulane Ave., 5 story, masonry, concrete, frame, limestone male internes bldg. Plans deposit $25. Extended date. CD 10/5.

SOON LETS CONTRACT

Md., Towson—RESIDENCE HALL—Goucher College St. Paul and 23 Sts., Baltimore, soon lets contract residence hall, $850,000. Moore & Hutchins, 215 E. 37 St., New York, N. Y., archts. CD 10/6.

N. Y., White Plains—HOSPITAL—White Plains Hospital, 41 E. Post Rd., soon lets contract hospital alterations, addn. Leonard Shultz & Assoc., 119 E. 40 St., New York Zone 17, archts.

LOW BIDDERS

●**Pa., Pittsburgh**—NURSES HOME, etc.—University of Pittsburgh, Forbes St., rejected bids Sept. 30, 14 story, brick, stone, steel nurses home and training school, Lathrop St. **$4,650,000.** Will re-advertise. CD 9/19.

Tex., Bryan—CHURCH—College Ave. Baptist Church, Bryan, Oct. 11, church, from McClellan-Brown-McClellan, 2215 Franklin St., Waco, **$288,863.** CD 10/4.

Ont., Hamilton — BUILDING — Y. M. C. A., 79 James St., S., project temporarily deferred 3 story, bsmnt., 66x100 ft., rein.-con., steel brick, Y. M. C. A. bldg. addn., alterations. Approx. **$300,000.** CD 9/6.

CONTRACTS AWARDED

Calif., Los Angeles—DWELLINGS—Glencrest Corp., 610 S. Glendale Ave., Glendale, 43 frame, stucco dwellings, to H. C. Roberts & P. L. Burkhardt, 610 S. Glendale Ave., Glendale. Approx. **$314,400.**

Calif., San Gabriel — DWELLINGS — P. L. McNutt, 2721½ S. San Gabriel Ave., 24 frame, stucco dwellings, owner builds. **$324,000.**

Conn., Milford—HOUSING—D. Drew & Lewis Mc Dermott, 122 Melba St., 21 frame homes, Crickle Rd., 45 sites and Yale Ave., 20 sites. Owner builds. Approx. **$250,000.**

Conn., West Hartford — HOUSING — Webster Co., Webster Hill Rd., West, 60 frame houses, 22 acre development, Webster Hill, Owner builds. **$500,000.** CD 10/19.

Del., Wilmington — APARTMENT — Edwin Bernhardt, 220 S 8 St., apartment, 18 and Broom Sts., separate contracts. Approx. **$800,000.** J. Ethan Fieldsteins, 1355 Walnut St., Phila., Pa., archt.

Ga., Decatur—DINING HALL—Agnes Scott College, Decatur, Letitia Pate Evans Dining Hall, to Barge-Thompson Contr. Co., 136 Ellis St. N. E., Atlanta. Approx. **$300,000.** Bids 9/21. CD 9/26, under LB.

Del., Wilmington—RESIDENTIAL DEVELOPMENT—James S. Conly, 700 Phila. Pike, Claymont, residential development, Fairfield Ave., separate contracts. **$250,000.**

Del., Wilmington—RESIDENTIAL DEVELOPMENT—Goodley & Nicholas Co., 301 Delaware Ave., residential development, Cleveland Ave., etc., separate contracts. **$250,000.**

Ill., Bellwood—SCHOOL—St. Simeon Parish, Bellwood and Butterfield, 2 story, bsmnt., 60x150 ft. and 150x180 ft. concrete, brick, stone school, to Patrick Warren Constr. Co., 815 N. Kedzie St., Chicago, Zone 22, **$780,000,** awarded 10/5. CD 8/25.

Ill., Chicago—HOME FOR AGED—Bethesda Home for Aged, 2823 N. Sacramento St., Zone 35, 5 story, 45x180 ft., rein.-con., brick addn., Home for Aged, separate contracts. **$300,000.** CD 10/14.

Md., Baltimore—RESIDENCES—Property Sales Co., Court Sq., Bldg., 84 two story, brick residences, 1000-1098 ½, and 1001-1083 Cameron Rd., separate contracts. **$368,200.**

N. J., Princeton—HOSPITAL, etc.—Princeton Hospital, Princeton, hospital addn. and nurses home, to Turner Constr. Co., 420 Lexington Ave., New York, N. Y., **$361,430.** Bids 9/29. CD 8/31.

N. Y., Corning—HOSPITAL—Corning Hospital, 163 First St., hospital addns., alterations, to The H. K. Ferguson Co., 1782 E. 11 St., Cleveland, 15, O., **$109,209.** Bids 6/15, awarded 9/26. CD 6/2.

O., Parma — HOUSING — Holslbauer Fodar Bldg. Co., 6655 Broadview Rd., twenty-nine 1½ story, bsmnt., frame houses, W. 52 St., separate contracts. Approx. **$261,000.**

Okla., Tulsa—SHOPPING CENTER—R. L. Morgan, 3704 E. Admiral Pl., suburban shopping center E. Admiral Pl., sub-contracts. Approx. **$300,000.** David Graham, 2919 E. 44 St., archts.

Pa., Bradford — APARTMENTS — Orchard Apartments, Inc., 62 Vista Circle, 6 story, bsmnt., 100x100 ft., brick on tile apartments, Orchard Pl., separate contracts. **$300,000.**

●**Pa., Harrisburg**—HOUSING—W. M. Hollinger, Dauphin Bldg., 216-unit garden type housing development, between Penn and Susquehanna Sts. from N. Bucknell to Shamokin Sts., own forces. **$2,000,000.**

Pa., Havertown—SHOPPING CENTER—Manon Shopping Center, 225 S. 15 St., Phila., shopping center, to Murrell Constr. Co., 1316 W. Thompson St., Phila., Approx. **$250,000.** Kaplan & Fish, 2120 Spruce St., Phila., archts.

Pa., Jeannette — LODGE—Fraternal Order of Eagles No. 844, Jeannette, 1 story, bsmnt., 80x122 ft., brick, limestone lodge, to Westmoreland Constr. Co., Greensburg, Approx. **$250,000.** Sorbello Engineering & Contracting, archts.

Pa., Meadville — NURSE HOME — Spencer Hospital, Meadville, 3 story, brick, steel nurses home, to George A. Rutherford Co., 2725 Prospect St., Cleveland, O. Approx. **$250,000.** CD 9/6.

Pa., Norristown—HOUSING—Erny & Nolen, 631 Germantown Ave., Phila., residential development, Woodbrook Lane, etc., separate contracts, Approx. **$250,000.** James A. Nolen, 6316 Germantown Ave., Phila., archt.

Pa., Overbrook Hills (Phila. P. O.)—RESIDENCES—James J. Clark, 7000 Argyle Rd., Overbrook Hills, residential development, Trenton Rd., etc., separate contracts. **$250,000.** David Slott, 7960 Garrett Rd., Upper Darby, archt.

Pa., Phila. — RESIDENCES—Ernest Berry, 6066 Ridge Ave., residential development, Delmar St., etc., separate contracts. **$250,000.**

Pa., Phila.—HOUSING—D. A. Dintenfass, 6905 Caster Ave., residential development, Eastwood Sts., separate contracts, **$250,000.** Christian H. Fries, 3701 N. Broad St., archt.

Pa., Phila.,—RESTAURANT—Horn & Hardart Baking Co., 1601 Chestnut St., restaurant, 12 and Market Sts., to Murphy-Quigly & Co., 1518 Sansom St., **$250,000.** CD 11/28/45.

Pa., Phila.—HOUSING—William Kushner, 1420 Chestnut St., residential development, Rhawn St., separate contracts, **$250,000.**

Pa., Phila.—HOUSING — Lardner Homes, Inc., 1741 Georges Lane, Phila., residential development, Lardner St., separate contracts. **$310,000.** Christian H. Fries, 3701 N. Broad St., Phila., archts.

Pa., Phila. — STORE — Sun Ray Drug Co., 1227 N. Broad St., drug store addns., alterations, to Massett Bldg. & Constr. Co., 1516 Atlantic Ave., Atlantic City, N. J., **$250,000.** Kaplan & Fish, 2120 Spruce St., archts. CD 8/12.

Pa., Pittsburgh—SCHOOL—DePaul Institute for the Deaf, Castlegate Ave., parochial primary grade school Castlegate Ave., to E. J. Busse Co., 1579 Noblestown Rd. Approx. **$380,000.** McMullin & McMullin, Renshaw Bldg., archts.

Pa., Pittsburgh—STORES—Iroquois Apartments, Inc., Atwood St., 100x230 ft., brick, tile stores, to Mike Leebov, Plaza Bldg., Approx. **$280,000.** Hyman Rosenberg, 406 Berger Bldg., archt.

Pa., Rosemont — RESIDENCES — Modern Housing Corp., William and Conestaga Rds., residential development, Fitz Williams Lane and William Rd., separate contracts. **$540,000.**

Pa., West Chester — HOSPITAL — Memorial Hospital of Chester County, 326 W. Walnut St., hospital addns., alterations, to Hood & Gross, Ferry Bldg., Phila., **$300,000.** Bids 9/8. CD 8/30.

R. I., Westerly—CHURCH—Central Baptist Parish, R. S. Crouch, chn. Bldg. Comn., Westerly, 1 and 2 story, bsmnt., 225,000 cu. ft. church, to E. J. Hollen, 222 Waterman St., Providence, **$317,928.** Est. $250,000. Bids 9/13. CD 8/19.

Tenn., Clarksville—OFFICE—Southern Bell Telephone Co., Hurt Bldg., Atlanta, Ga., dial and toll office, to Beers Constr. Co., 70 Ellis St. N. E., Atlanta, Ga. Approx. **$300,000.** Bids 9/26. CD 9/15.

Tex., Houston — DWELLINGS — Coastwise Const. Co., 1309 Capitol St., 30 dwellings. Owner builds. Approx. **$263,000.** CD 10/12.

Tex., Port Arthur—APARTMENT—Christian & Worth, c/o Griffin Apartments, 80 single unit, 1 story apartments, concrete slab fdn. Owner builds. Approx. **$550,000.** CD 10/12.

Man., Flin Flon—HOUSING—O. F. Wright, Flin Flon, 50 houses, East Birchview sub division. Owner builds. **$310,000.**

Que., Montreal — HOUSING — Parkdale Homes Development Corp., 630 Dorchester St. W., one hundred 1½ story, bsmnt., concrete, brick houses, W. Broadway Ave. Owner builds. Approx. **$750,000.** G. Shubin, 1415 St. Mark St., archt.

Ont., London — HOUSING — F. F. Feliner, 376 Marncliffe Rd. N., 130 houses, London West, day labor, Approx. **$900,000.**

INDUSTRIAL BUILDINGS

BIDS ASKED

November 17

●**Pa., Newton Square**—SCIENCE CENTER—Sun Oil Co., 1608 Walnut St., Phila., science center, $4,000,000. Frederick G. Frost Jr., 144 E. 30 St., New York, N. Y., archt. Wohlpart & Hart, 155 E. 42 St., New York, N. Y., engrs. CD 1/27.

LOW BIDDERS

Ia., Mt. Pleasant—GARAGE, etc.—Southeast Iowa Co-operative Electric Assn., Oct. 13, 1 story, 30x130 ft. masonry, steel garage, office bldg. and warehouse space, etc., from Kucharo & Assoc., 225 Jewett Bldg., Des Moines, **$98,200.** CD 6/16.

S. C., Charleston—PLANT—Charleston Industrial Assn., 152 Market St., Oct. 17, coffee roasting and importing plant from Charleston Constructors, Inc., 2 Exchange Place, Wharf, **$69,765.** William B. Reily & Co., Inc., New Orleans, La., lessee. CD 10/11.

CONTRACTS AWARDED

Ill., Belvidere—FACTORY—Midwest Bottle Cap Co., R. W. Blodget, pres., 1 story, brick, concrete block 15,000 sq. ft. factory, to Glass Concrete Co., Belvidere, **$68,000.** CD 7/5.

Minn., Litchfield—WAREHOUSE, etc.—Farm Feed Mfg. Co., H. Hanson, mgr., general contract 110x120 ft. cement block, steel warehouse, 18 ft. high 33x40 ft. concrete, steel feed mfg. plant, 100 ft. high, 30x76 ft. concrete custom grinding mill, office with 30-ton scale, to J. Hartnung Constr. Co., Aberdeen, S. D., Approx. **$200,000.** CD 9/6.

R. I., Pawtucket—WAREHOUSE—Harry Gershman, Dexter St., Central Falls, 2 story, bsmnt., 60x90 ft., cinder block, steel warehouse, Pleasant and Taft Sts. to Joseph J. Armaral, 30 Wood St., Approx. **$68,000.** CD 9/6.

S. C., Charleston—SALES and SERVICE—Santo Bottile, 210 Meeting St., steel, concrete sales and service agency for machinery manufacturer to N. W. Todd Eng. & Supply Co., 316 East Bay St., **$150,000.** Awarded 10/17. Archie B. Myers, King and Mount Pleasant Sts., archt. CD 9/26/45.

●**W. Va., Parkersburg**—PLANT—E. I. duPont de Nemours, duPont Bldg., Wilmington, Del., 3 story, 100x200 ft., brick, steel plant addn., separate contracts, **$1,500,000.**

Ont., Belleville — PLANT — Avon Jewelery Ltd., 323 Pinnacle St., 1 story, bsmnt., brick, steel jewelery plant, to St. Lawrence Contg. Co., Ltd., Wallbridge Rd. Approx. **$85,000.** W. J. Watson, 244 Front St., archt.

Ont., Galt—PLANT—Galt Daily Reporter, 24 Water St. W., 2 story, part bsmnt., 85x120 ft., brick, steel newspaper plant, concrete fdns., Ainslie St., to Thomas Constr. Co., Ltd., 45 Dickson St. Approx. **$150,000.** Bids 8/29. CD 8/12.

Que., Granby—FACTORY—Peeters Textile Mills, Ltd., 225 S. Charles St., 1 story, 145x176 ft., concrete, steel frame, concrete block textile

factory, concrete fdns., Frontenac St., to Carolus Marquis, 282 Pare St., Approx. **$100,000.** CD 8/25.

UNCLASSIFIED

BIDS ASKED

November 15

†North Dakota—TRANSFORMERS, etc.—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point, f.o.b. cars Rugby, Devils Lake, Lakoto, Carrington, Jamestown, Valley City, Edgeley, Forman and Washburn, outdoor power transformers with automatic-tap-changing-underload equip., outdoor lightning arresters; outdoor autotransformers, for advance power sys., REA Cooperatives, Missouri River Basin Proj., Spec. 2813. L. N. McClellan, ch. engr.

November 10

Tex., Yoakum—SWIMMING POOL, etc.—City, concrete swimming pool and bathhouse. Approx. $50,000. Earl F. Miles, No. 6 Crain Bldg., Cuero, engr.

December 9

●†Wash., Everett—TRANSMITTER BLDG.—Bureau Yards & Docks, Seattle, rein.-con. T-shaped transmitter bldg., at Jim Creek, near here. Approx. $1,000,000.

About January 15

●Kan., Hutchinson—FIELD HOUSE—City, H. B. McClintock, mgr., rein.-con., brick, 53,000 sq. ft., field house. Approx. $1,000,000. Mann & Co., P. O. Box 1148, Hutchinson, archts. and engrs. Extended date. CD 5/18.

Bids Asked

Ariz., Willcox—GAS LINES—El Paso Natural Gas Co., Bassett Tower, San Antonio Tex., 11 mi. natural gas line, $90,000.

●Louisiana—RURAL DISTRIBUTION LINES—United Gas Pipe Line Co., 1525 Fairfield, Shreveport, 165.6 mi. 20-in. loop natural gas line, De Soto Co. $4,000,000. CD 9/1.

New Mexico—GAS LINES—El Paso Natural Gas Co., Bassett Tower, San Antonio, Tex., 82.1 mi. natural gas lines, Alamogordo, White Sands, Holloman. $600,630. CD 7/9/46.

SOON LETS CONTRACT

Texas—RURAL DISTRIBUTION LINES—Coleman County Electric Co-operative, Inc., c/o E. E. Evans, pres., Coleman, soon lets contract approx. 164.54 mi. rural distr. lines and converting approx. 6.7 mi. existing lines, Coleman, Coke, Runnels, Concho and Brown Counties. $182,000. Freese & Nichols, 407 Daniger Bldg., Fort Worth, engrs. CD 6/27/46.

LOW BIDDERS

Minnesota—RURAL DISTRIBUTION LINES—Central Minnesota Co-operative Power Assn., W. W. Hanzlik, pres., Oct. 7, about 216 mi. rural distr. lines, Redwood Co., (Minn. 60-G Redwood), from O. A. Mork, Clarkfield, **$242,401.** Banister Eng. Co., 1549 University Ave., St. Paul, engr.

†N. J., Fort Dix—SWIMMING POOL, etc.—U. S. Eng., 120 Wall St., New York, 5, N. Y., Oct. 18, swimming pool and bathhouses, from Daly & Co., 1427-33 Cornell Ave., Trenton, **$139,994.** CD 9/12.

N. Y., New York—D. C. CONNECTIONS—Bd. Transportation, 250 Hudson St., Zone 17, Oct. 7, furnishing, installing D. C. connections, track bonding and associated work for Pelham Line, Hunts Point Ave. to Pelham Bay Park, Bronx Boro, from Jandous Electric Constr. Corp., 210 E. 40 St., Zone 16, **$128,500.** CD 9/22.

N. Y., New York—SUBSTATIONS, etc.—Bd. Transportation, 250 Hudson St., Zone 13, Sept. 30, Contr. 1, general contract Bradey and Allerton substations, circuit breaker house and signal tower for Dyre Avenue Line, Bronx Boro, from Amdor Structures, Inc., 147 E. 86 St., **$211,980.** CD 9/14.

Pa., Johnstown — MEMORIAL ARENA — Cambria County War Memorial, Inc., 1st Natl. Bank Bldg., Oct. 19, memorial arena, from Berkebile Bros., Swank Bldg., **$648,766.** CD 9/27.

●†Texas — RAILROAD RELOCATION — U. S. Eng., 606 Santa Fe Bldg., Galveston, Oct. 13, relocating M K & T. Ry. Co. railroad, DeLeon Div. in vicinity Whitney Dam and Reservoir, from Winston Bros. Co., 1470 Northwestern Bank Bldg., Minneapolis, Minn., **$1,830,966.** Est. $2,000,000. CD 9/13.

CONTRACTS AWARDED

Calif., Bakersfield—RECREATION BLDG.—Kern Co., Courthouse, recreation bldg. at Juvenile Forestry Camp, to Pacific Prebuilt Homes, 17501 S. Figueroa St., Gardena, **$68,581.** Bids 9/26, awarded 10/10 CD 2/5, under Public Bldgs.

Connecticut—DUAL SERVICE STATIONS—State, G. Albert Hill, hy. comr., State Office Bldg., Hartford, dual gas service stations, north of State St. underpass, Wilbur Cross Parkway, to De Fonce Constr. Co., 110 Colonial Ave., Bridgeport, **$104,840.** CD 9/28, under LB.

Ill., Effingham — DRIVE-IN THEATER — Harry R. Jones, c/o Janes Materials Co., Lawrenceville, approx. 750 car capacity drive-in motion picture theater, U. S. Rte. 40, 1 mi. east of city limits, separate contracts, **$100,000.**

Ky., Louisville — RADIO TOWER — Radio Station WHAS, c/o contractor, radio tower, to Henry Bickel Co., 1020 E. Chestnut St., **$94,000.**

Miss., Centreville—NATURAL GAS SYSTEM—City, natural gas sys., to Louisiana-Mississippi Pipe Line Corp., Baton Rouge, La., **$93,647.**

Missouri—RURAL DISTRIBUTION LINES—Co-Mo Electric Co-operative, Jack H. Needy, mgr., Tipton, labor only, 405.95 mi. rural distr. lines and 39.5 mi. conversion lines in Cooper, Monteau, Cole, Benton, Morgan and Camden Counties, to Triple H Constr. Co., Linton, Ind., **$215,174.** CD 10/7.

Montana—RURAL DISTRIBUION LINES—Tongue River Electric Co-operative, Terry, Oct. 6, 83.9 mi. single phase 2 wire and .95 mi. 3 wire rural distr. lines, Prairie, Custer and Dawson Counties, to Line Builders, Billings, **$75,776.** CD 9/28.

N. J., Lawrenceville — FIELD HOUSE — Lawrenceville School, Lawrenceville, field house, to White Constr. Co., 95 Madison Ave., New York, N. Y., **$400,000.** Bids 9/27. CD 8/31.

Oklahoma — PIPELINE — Consolidated Gas Utilities Corp., Braniff Bldg., Oklahoma City, 28 mi. 12¾ in. pipeline, Beckham and Washita Counties, Purchase and Hire. Approx. **$150,000.** CD 10/7.

Oklahoma—PIPELINE—Shell Oil Co., Inc., 1st. Natl. Bank Bldg., Oklahoma City, field pipeline gathering sys., Beckham and Washita Counties, own forces. Approx. **$90,000.** CD 8/9.

Oklahoma—PIPELINE—Stanolind Pipe Line Co., Stanolind Bldg., Tulsa, field pipeline gathering sys., Lenapah area, Nowata Co., own forces. **$110,000.** CD 10/7.

Texas—OIL PIPELINE—Republic Pipe Line Co., Wilson Bldg., Corpus Christi, 40 mi. 4 in. crude oil pipeline, Nueces Co., own forces. Approx. **$450,000.** CD 10/11.

Texas—OIL PIPELINE—Stanolind Pipe Line Co., Stanolind Bldg., Tulsa, Okla., crude oil pipeline gathering sys., Cochran Co., own forces. **$110,000.** CD 10/7.

Texas—OIL PIPELINE—Texas-New Mexico Pipe Line Co., 720 San Jacinto St., Houston, 40 mi. 10 in. crude oil trunk carrier from southeast Scurry Co. to southwest Borden Co. line, at Hermleigh, **$375,000;** 6 mi. 6 in. and 6 mi. 12 in. crude oil from Terminal to field, at Borden, Approx. **$60,000,** own forces. CD 6/7/46.

Alta., Redwater — WELL DRILLING — Canadian Gulf Oil Corp., Calgary, well drilling, to Falcon Seaboard of Canada, Ltd., P. O. Box 238, Calgary, Approx. **$100,000.**

Proposal Advertisements see pp. 103, 104.

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OFFICIAL PROPOSALS

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 2811) will be received by Bureau of Reclamation, Denver, Colorado, December 1, 1949, and then publicly opened for furnishing three 16,667-kva, unity-power-factor, 150-rpm, 6,900-volt, 3-phase, 60-cycle, vertical-shaft, alternating-current generators, complete with direct-connected exciters, for Canyon Ferry Power Plant, Missouri River Basin Project, Montana. Delivery is desired within 810 to 990 days. For particulars, address Bureau of Reclamation, Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner. (400)

OFFICIAL PROPOSALS

Bids: November 7, 1949 (405)

Clearing Rondout Reservoir

CONTRACT 345

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall street, New York City, until 11:00 A.M., Eastern Standard Time, on Monday, November 7, 1949, for Contract 345, for clearing approximately 900 acres below Elevation 760 in the lower portion of the Rondout reservoir in preparation for the storage of water, all as set forth in the specifications. The Rondout reservoir is located in the Towns of Wawarsing, Ulster county, and Neversink, Sullivan county, New York.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of The City of New York, in the amount of sixteen thousand dollars ($16,000.00), for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained at the office of the Chief Engineer, Room 1311, at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. Arrangements will be made whereby prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, HENRY HESTERBERG, RUFUS E. McGAHEN, Commissioners, Board of Water Supply; RICHARD H. BURKE, Secretary.

Bids: November 14, 1949 (410)

Construction of Sanitary Sewer

LATERAL SEWER DISTRICT #12
Village of Freeport, N. Y.

SEALED PROPOSALS will be received by the Board of Sewer Commissioners of the Village of Freeport, N. Y., at the Municipal Building, 46 North Ocean Avenue, Freeport, N. Y., at 8:00 P.M., November 14th, 1949, at which time they will be publicly opened and read and the contract awarded as soon thereafter as practicable, for the construction of Sanitary Sewers, consisting of about 3,110 linear feet of 8-inch diameter pipes, together with 5-inch house laterals to curb, manholes and appurtenant structures.

Plans and specifications may be seen and obtained at the Village Office or at the Office of Baldwin & Cornelius Co. Inc., 117 West Sunrise Highway, Freeport, N. Y. They may be taken away by prospective bidders upon deposit of $25.00, which sum will be refunded to Contractors who submit bids.

Each bid must be accompanied by a certified check on a solvent bank or Trust Company in the sum of $2,000.00, made payable to the Village of Freeport. Each bid shall also be accompanied by a consent in writing of a Surety Company authorized to do business according to the Laws of the State of New York.

The Board of Sewer Commissioners reserves the right to reject any or all bids and to accept the bid which they deem to be most favorable to the interests of the Village.

No. bidder may withdraw his bid within 45 days after the date set for the opening thereof.

Documents may be obtained by prospective bidders until 4:00 P.M., November 9, 1949.

LEO FISHEL
MICHAEL J. COFFEY
EDWARD M. VOELKER
Board of Sewer Commissioners,
Village of Freeport, N. Y.

Dated: October 19, 1949
George F. Hasbrouck
Village Clerk

Bids: December 12, 1949 (411)

Refuse Incinerator

LAWRENCE, MASSACHUSETTS

Sealed bids for constructing a refuse incinerator will be received at the Office of the City Clerk, City Hall, Common Street, Lawrence, Massachusetts, until 9:30 o'clock A.M., Eastern Standard Time, on Monday, December 12th, 1949, and will be publicly opened and read aloud at a meeting of the City Council immediately thereafter.

Drawings and contract documents may be examined and obtained at the above office, at the office of Ashton, Huntress & Pratt, 477 Essex Street, Lawrence, Mass. and at the office of Metcalf & Eddy, 1300 Statler Building, Boston, Mass. A deposit of $25 will be required for each set of drawings and documents.

As Bid security a certified check or bid bond in the amount of $25,000 must be furnished. The successful bidder must furnish a performance bond in the amount of not less than 100% of the contract price.

Requirements should be noted as to conditions of employment, wage rates, and filing of sub-bids.

City of Lawrence, Massachusetts
By Gordon E. Gaffney
City Clerk

Bids: October 31, 1949 (407)

Water Main Construction

WASHINGTON SUBURBAN SANITARY COMMISSION
CONTRACT NO. 694-W

Sealed proposals for constructing approximately 24,850 feet of 42" supply line from Willis School Filtration Plant near Laurel, Maryland to Columbia Pike near Paint Branch, Prince George's and Montgomery Counties, Maryland, will be received at the office of the Washington Suburban Sanitary Commission, Hamilton Street, Hyattsville, Maryland, until Monday, October 31, 1949 at 1:00 P. M., Eastern Standard Time, at which place and time they will be publicly opened and read. Alternate bids are asked on cast iron, steel, reinforced concrete, prestressed, and reinforced concrete cylinder pipe.

Plans and specifications may be obtained from the office of the Chief Engineer of the Commission, Hyattsville, Maryland upon deposit of $10.00, which deposit will be returned to bidders or to those returning plans and specifications in good condition.

Dwight B. Galt
Warren Browning
Leland G. Worthington
Commissioners

Bids: November 10, 1949 (403)

Apron Paving and Drainage

THE PORT OF NEW YORK AUTHORITY
NEWARK AIRPORT
CONTRACT NA-19

Sealed proposals for apron paving and drainage at Newark Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 11:00 A. M., Thursday, November 10, 1949, and thereafter in the Auditorium of the Authority at the same address until 11:30 A. M. on the same date, at which latter time and place said proposals will be publicly opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $25.00 per set. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman,
Chairman.

New York, October 27, 1949.

Bids: November 30, 1949 (412)

Terminal Building

THE PORT OF NEW YORK AUTHORITY
PORT AUTHORITY BUS TERMINAL
CONTRACT BT-5

Sealed proposals for the construction of the Terminal Building, exclusive of steelwork and foundations, for the Port Authority Bus Terminal will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:00 P. M. Wednesday, November 30, 1949, and thereafter in the Auditorium of the Authority at the same address until 2:30 P. M. on the same date, at which latter time and place said proposals will be publicly opened and read.

Contract documents may be seen after November 1, 1949 at the office of the Chief Engineer, and copies will be furnished after that date upon deposit of $100.00 per set. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman,
Chairman.

New York, October 27, 1949

Bids: November 7, 1949 (413)

Water Pumping Station at Willis School

WASHINGTON SUBURBAN SANITARY COMMISSION
CONTRACT NO. 691-W
FILTRATION PLANT NEAR
LAUREL, MD.

Sealed proposals for constructing a water pumping station including the building, pumps and appurtenant piping, electrical substation and controls, roadway and site improvement, will be received at the office of the Washington Suburban Sanitary Commission, Hyattsville, Maryland, until Monday, November 7, 1949 at 1:00 P.M., Eastern Standard Time, at which place and time they will be publicly opened and read.

Plans and specifications may be obtained from the office of the Chief Engineer of the Commission, Hyattsville, Maryland, upon deposit of $20.00, which deposit will be returned to bidders or to those returning plans and specifications in good condition.

Dwight B. Galt
Warren Browning
Leland G. Worthington
Commissioners

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P-1257, Engineering News-Record
330 West 42nd St., New York 18, N. Y.

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P-1216, Engineering News-Record
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Notice to Advertisers

Because of the Holiday, Election Day, November 8th, the "Searchlight" pages of the

Nov. 17th Issue of ENGINEERING NEWS-RECORD

Close for press earlier than the usual weekly closing time.

The cooperation of advertisers is solicited in forwarding new copy, or changes of copy, to reach us accordingly.

FINAL CLOSING TIME
Display and Undisplayed Ads
Monday, Nov. 7th
PROPOSALS
Thursday, Nov. 10th

WANTED

Compressors Wanted
STATIONARY - PORTABLE
LARGE OR SMALL
L. W. BAUER
22 Barnett Street Bloomfield, N. J.

WANTED
ASPHALT PLANT
Batch Type. Either 1000 or 1500 pounds, complete for hot mix asphalt.
W-1187, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

WANTED
1—Backhoe for Northwest No. 6
1—60' Boom
WILLIAMS CONSTRUCTION CO.
Box 145, Middle River Baltimore 20, Md.
Phone: Essex 1310

WANTED
Used and Rebuilt G.M. Series 71
Industrial Model Diesel Engines
State price, age, condition & complete specifications to:
JOHNSON ENGINEERING COMPANY
R. F. D. #1 Hialeah, Florida

WANTED
40 to 50 ton low-boy flat trailer drop deck type, also tractor truck to pull this unit. 50 to 80 cubic yard three compartment steel concrete batching bin with weigh batcher.
Write P. O. Box 755
Langley Field, Va.

If there is anything you want
or something you don't want that readers can supply—or use—*advertise it in the*
Searchlight Section

L.B.SMITH INC.

OFFERS

SHOVELS — CRANES

Lorain 41, ¾-yd shovel, crane or hoe, new 1949.
Lorain 75A, 1¼yd shovel or crane, gas power.
Lorain 75B, 1½-yd shovel, crane, hoe, Caterpillar D11000.

SHOVEL ATTACHMENT

Lorain 30A chain crowd, LBS#5142, 16' boom 13'4" stick ½-yd dipper.
Lorain 40 Hi-Lift, 25' boom 19'8" stick LBS #5877, new ¾-yd dipper LBS#7750.
P&H 203A, LBS#2527, 19'6" boom 13' stick ⅝-yd dipper.
Bucyrus-Erie 30B tunnel front 9' stick 1½-yd dipper LBS#3392.
Koehring 502 with necessary parts to convert from crane to shovel, 21' boom 16' stick 1¼-yd dipper.

BACKHOE ATTACHMENT

Lorain 41 backhoe, LBS#5429, with 18' boom, 7' stick, 36" cutting width Amsco bucket. Will fit any ¾-yd Lorain with serial number over 9.000.
Backhoe attachment for Lorain or Northwest 1¼-yd machine

BACKHOE BUCKETS

¾-yd Lorain, 40, LBS#6105, 44" cutting width, teeth, sheave.
27" outside width drop bottom type LBS #1033, good condition.
26" outside width solid bottom type LBS #4377, good condition.

NEW TAGLINES

McCaffrey Model 648 for 1¼ to 2-yd crane.
McCaffrey Model 636 for ¾-yd to 1-yd crane.

SHOVEL DIPPERS

Bucyrus-Erie 20B, ¾-yd LBS#3801.
Lorain 41, ¾-yd, LBS #7433, new condition.
New Lima 1-yd, Amsco, LBS#2295.
Bucyrus-Erie 1¼-yd gas air, LBS#3782, fair.
Lorain 75 manganese 1¼-yd, LBS#7233, teeth and bail.
Lorain 75B, 1¼-yd extended lip, 1¾-yd LBS#2260.
Pettibone-Mulliken 2-yd Lorain 82 or 820, manganese, LBS#5361.
Pettibone-Mulliken 2-yd for 3500 Manitowac LBS#5763.

CLAM—DRAG—SCRAPER BUCKETS

AIR COMPRESSORS

Worthington two-stage, water cooled, vertical 250#, 60 CFM, new condition.
Gardner-Denver, 105 foot, with air receiver, hose reel, driven by power take-off and mounted 1941 Ford.
Gardner-Denver air-cooled 105 foot with receiver, V-Belt driven from power take-off and mounted on 1942 Ford chassis with Wood two-yard dump body.
Gardner-Denver 2-stage 160 ft., skid Mtd.
Worthington 210 cubic foot, two-stage air-cooled, on steel wheels, Hercules diesel.
Chicago Pneumatic 210 cubic foot, two-stage, air-cooled, Caterpillar diesel on four rubber tired wheels.
Gardner-Denver 315 cu. ft. two-stage, skid mounted, Murphy four-cylinder diesel.
Pennsylvania 12" x 10" class 3A single cylinder, 355 cubic foot P.D., flat belt driven, 50 HP slip ring motor.

QUARRY EQUIPMENT & BINS

New 16 x 16 double clamshell gates.
20" x 6'6" Belt Type Magnetic Separator.
3018 Cedarapids roller bearing roll crusher, new condition, new warranty, used as demonstrator only.
18 x 36 Farrell deep jaw crusher, with McLanahan 3' x 7' roll type feeder.
10 x 36 Cedarapids, practically new.
10 x 20 Champion #4½ prim. jaw crusher.
10 x 7 Allis Chal. Blake type jaw crusher.
Williams 20-S pulverizer.
Cedarapids No. 1 Kubit.
60 ton 2 compartment storage bin with clam shell gates.

TRUCKS—TRAILERS

1½-ton Ford & Chevrolet.
2½-ton GMC, New and rebuilt.
Sterling COE Model 255GCS tandem drive tractor, 9.00x24 tires, 200 HP Cummins supercharged diesel, complete with 40-ton Rogers low bed equipment trailer, 16—7.50 x20 tires, airbrakes, outriggers, excellent condition.
Van Trailers with 17' x 7'8" x 6' bodies. Five ton capacity.
2.000 gallon tanks on semi-trailer mounting.
New and rebuilt dump bodies.
6x6 7½-ton Reo

GASOLINE AND DIESEL ENGINES

New JXD Hercules Gasoline.
Buda, Hercules, Hill diesels, rebuilt.
New Murphy 4 and 6 cylinder diesels.
GM 6 and 12 cylinder diesels, practically new.

CONCRETE ROAD BUILDING & MISCELLANEOUS CONCRETE HANDLING EQUIPMENT

Pavers & Mixers

Ransome 34E dual drum, new October, 1943, with 36'9" boom, 1000 gallon auxiliary water tank, Cummins engine, rebuilt.
Jaeger Model 14DL, non-tilt mixer, rebuilt.

Concrete Finishers

Jaeger type "L" double screed, 10½'-12½', rebuilt.
Heltzel 10'-12' finisher, rebuilt.
Blaw-Knox gas-electric 10½'-12½', rebuilt.
2 Koehring 10'-12', rebuilt.
Koehring 10'-16' finisher, rebuilt.

Concrete Spreaders

Blaw-Knox type SA 10'-15' spreader, new 1943. New condition.

Concrete Road Forms

830'—Truscon 7"x8" forms, with stakes.
1380'—Heltzel 7"x8" forms, with stakes.
1300'—Blaw-Knox 8"x8" forms, with stakes.
4450—Heltzel 9"x8" forms, with stakes.
1430'—Heltzel 10"x8" forms, with stakes.
1010'—Blaw-Knox 10"x8" forms, with stakes.

Fine Grade Machines

Flynn surgrader 10'-12', rebuilt.
R.B. Fine Grader for 21' width, rebuilt.

Form Graders—2 of each

Cleveland formgrader, new condition.
Carr formgrader, new 1944, rebuilt.

BELT CONVEYORS

New 18"—24"—30"—36"
- "Sealed-for-life" idlers
- Lattice or channel frame
- Shipment from stock depending on length

DIESEL GENERATORS

7½ KW to 125 KW. Alternating and direct current.

GRADERS

New Warco D76 tandem driven grader, 12' blade, V-type scarifier, 13.00x24 tires all around, 24,500 lbs., International UD14A diesel engine.
Caterpillar 44 hydraulically operated drawn grader, 12' blade, wt. 8,300 lbs.
York Corporation Model SR drawn grader with scarifier, 8' blade, rakes, pneumatics, wt. 7,900 lbs.

DIESEL POWERED TRACTORS

"FD" Cletrac with Buckeye blade and double drum P.C.U.

***Phone* HARRISBURG, PA. 7-3431**

LASTING • BONAFIDE • SERVICE — L.B. SMITH, INC.

L.B.SMITH INC. CAMP HILL, PA. SUBURB OF HARRISBURG

WE OWN THE EQUIPMENT WE ADVERTISE

BRAND NEW *Buday* *Portable* POWER SAW

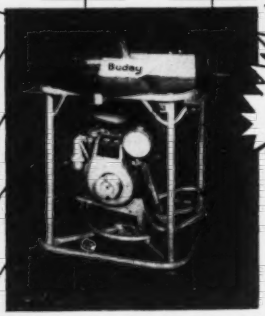
RIPS | MITERS | BEVEL RIPS

CROSS CUTS

ANGLE MITERS

RABBETS and TENONS

CUTS PLY WOOD



SPECIFICATIONS: SAW DIAMETER 10 inches. *GAS ENGINE 3.6 H.P. TABLE TOP 35½" Dia. SHIPPING WT. 460 lbs. *Also available with electric motor

SUPER BARGAIN SAW SALE

was ~~$400.00~~

NOW

$295.00

FOB Minneapolis or Milwaukee, U.S.A.

TAKE THE SHOP TO THE JOB

This PORTABLE power saw matches performance with finest shop equipment. Gives skilled labor precision equipment right on the job . . . cuts costs to the bone . . . steps on-the-job production to new peak. The Buday saw makes every kind of cut . . . handles all lumber width and length . . . up to 4 inches thick!

EVERY SAW FULLY GUARANTEED

BRAND NEW! Made by one of World's leading Precision Equipment manufacturers. In original crates with all equipment.

PORTABLE! Self-contained 3.6 H.P. Briggs & Stratton or Wisconsin gasoline engine. Weighs only 340 pounds. Easily handled by two men. Ready to operate in less than 2 minutes.

ROTATING TABLE TOP! The ONLY portable power saw with rotating table for rapid change to all cutting angles. Big 3 foot table, precision marked in degrees and carpenter pitch, locks securely in any desired position.

SWINGING ARBOR! Balanced to swing away from operator for added safety. Hand and foot guided. Operator's foot does the work.

SPECIAL EQUIPMENT! Available at extra cost are (A) 12 inch diameter saw (B) Roller extension tables (C) Electric motor to convert Buday for production line and shop installation. Write for detailed information.

SPECIAL DISCOUNTS TO WHOLESALERS

MAIL THIS COUPON TODAY!

Ennis Supply Company Dept. ENS-10
334 First Street North
Minneapolis 1, Minnesota, U.S.A.

Please ship us ( ) Buday Portable Power Saws FOB ( ) MINNEAPOLIS ( ) MILWAUKEE via ( ) Fast Freight ( ) Motor Truck.

NAME_____

ADDRESS_____

CITY_____ ( ) STATE_____

SOLD EXCLUSIVELY BY

ENNIS SUPPLY CO. 334 First Street North Minneapolis 1, Minnesota, U.S.A.

FOR SALE

2 Koehring Gantrys Convertible to Caterpillars

FS-9630, Engineering News-Record
330 W. 42nd Street, New York 18, N. Y.

For Sale at a Bargain Price

2—D8 Tractors 8R Series
1—D7 Tractor 7M Series
1—D8 Tractor 1H Series

All in good working condition, equipped with LeTourneau equipment.

1—Lima Model 750, 1¾ yd. diesel, air control, excellent condition.
1—Osgood Model 800, 1½ yd. diesel, air control, excellent condition.

TUCKAHOE CONSTRUCTION CO.
116 Columbus Avenue, Tuckahoe 7, N. Y.

FOR SALE

One or more at $300 each:

New Army Surplus cable operated bulldozer blades for Caterpillar Model D-7s, complete with front A frame with built-in radiator guard, trunnion mounts etc.

T-9 International Tractor with Trackson crane almost new $2300.

2—Late Model Caterpillar 8-R, D-8 Tractor with Angledozer Blade $9500.

DANBURY MOTOR EXCHANGE
P. O. Box 1017, Danbury, Conn.
Phone 2344 or 3240

FOR SALE

Available after September 1, 1949

1—Marion ¾ c.y. shovel 1942 Model 331 with Backhoe attachment complete.
1—Adams Grader, 1941 Model #303-H-371.
1—Parsons Trencher, Model #25, Serial #1560.
1—TD 14, 1946 International Hydraulic Control Bulldozer Serial #TDF-12512 T11F.

All equipment recently overhauled and in first class condition, attractively priced. Further details upon request.

E. B. McGURK, INC.
P. O. Box #630, 355 Barbour Street
Hartford, Conn.
Telephone—Hartford 7-7106
S. F. Mitchell, Pur. Agent

1,000 NEW SAFETY HELMETS

Very Specially Priced Type K. "Skullgards" made by Mine Safety Appliances

Also available, 500 Winter Liner Sets (cap and ear-laps)

NATIONAL EQUIPMENT SALES, INC.
24-16 Jackson Av. L. I. C. 1, N. Y.

New Guaranteed . . . 60 TON
HYDRAULIC JACKS
Navy Surplus
ILLUSTRATED CATALOG **60% off**
BERKELEY DISTRIBUTORS INC.
16 JOHNSON AVE HACKENSACK N. J.

FOR SALE

1—N. W. Shovel
1½ c.y., Diesel New, never been used.
A. V. WILLIAMS
Box 145, Baltimore 20, Md.
Phone: Essex 1312

FOR SALE

HAISS BUCKET LOADER

Model 75-W on Rubber tires Capacity 3 cu. yd. per minute New—1948. Used very little.
— BARGAIN —

KEYSTONE CONSTRUCTION COMPANY
MEADVILLE, PA.

DEPENDABLE USED MACHINES

Special.—Universal ½ yd. crawler backhoe and dragline, rebuilt, $2850

Bay City 25 dragline
Byers 83 dragline
Osgood 200 backhoe
Universal truck crane
3000# drop hammer
Caterpillar Krane Krawler
Browning 20 ton erectors crane
Lippman portable agstone plant
Pioneer 12" x 14' apron feeder
Badger portable gravel plant
Morris 10" gravel pump
Carter 4" s.p. pump
RD-7 with bulldozer
UD-18 Diesel power unit
½ yd. single line bucket

We move to our new plant Jan. 1st; meanwhile prices greatly reduced.

3505 W. 51st St. TRACTOR & EQUIPMENT CO. Chicago, 32

PUMPS AT SACRIFICE

Factory New Barnes Centrifugal Pump Sizes 1½" to 6" and Barnes Single Diaphragm Pumps Immediate delivery

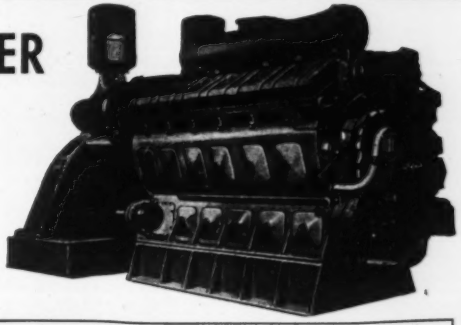
HODGE & HAMMOND, INC.
1100 E. 156th Street, New York 59, N. Y.

DIESEL ELECTRIC POWER

FOR

IMMEDIATE DELIVERY

UNIT CAPACITIES—10 TO 1875 KVA
A. C.—50 AND 60 CYCLES
ANY VOLTAGE



A PARTIAL LIST OF OUR INVENTORY

KVA	Make	Model	HP	RPM	KVA	Make	Model	HP	RPM
1875	Fairbanks Morse	33E16	2000	300	375	Enterprise	DSG-6	450	450
1420	Fairbanks Morse	38D8⅛	1600	720	330	Superior	KNA	396	514
1250	General Motors	16-278A	1600	720	312	General Motors	8-268A	450	1200
937.5	General Motors	12-567	1080	720	187	Ingersoll Rand	S	225	514
625	Alco	6-12½x13T	750	600	125	General Motors	3-268A	150	1200
425	Baldwin	VO-6	510	450	75	General Motors	6-71	90	1200

WRITE FOR COMPLETE INFORMATION

Engineered AGSCO DIESEL POWER

A. G. SCHOONMAKER Company, Inc.

Diesel Engines • Power Machinery

ESTABLISHED 1898

DIESEL DIVISION **50 CHURCH STREET, NEW YORK 7, N. Y.**

New and Guaranteed Used
Steel PIPE and TUBING
For Every Purpose
New and Guaranteed Used
Steel TANKS
Welded - Riveted - Bolted
For High Pressure; also ordinary storage
Up to 74,000 bbl. capacity
Large stocks carried everywhere for IMMEDIATE SHIPMENT
A. GREENSPON PIPE CO., INC.
(In Business 73 years)
3615 Olive St. St. Louis 8, Mo.
FRanklin 0064 or 1606

TRACTORS

2—DW10 Caterpillar with D4600 diesel engine, electric starter, 10.00 x 24 14-ply front tires, 18.00 x 24 20-ply drive tires and PD10 Athey side dump trailers with 14.00 x 20 16-ply dual trailer tires. New—1947.

L. B. SMITH, INC., Camp Hill, Pa.
PHILADELPHIA, PA. SYRACUSE, N. Y.

BOILERS

10 to 1000 H. P.
NEW-USED RECONDITIONED
Steam, Gas and Electric Power Equipment
J. PARKER THOMPSON CO., INC.
507 FIFTH AVE., NEW YORK CITY
MURRAY HILL 7-6547-8-9

Caterpillar Diesel Engines

Model D-13,000 and D-8800

Complete - Very few hours

JULIUS HEBENSTREIT, INC.
56-15 58th St., Maspeth, L. I., N. Y.
Tel. Davenport 6-1461
Cable Address: Habenjul New York

SHOVELS & CRANES

1—Northwest Model 78D—2 yd. diesel shovel
2—Northwest Model 25—crawler crane, shovel, Pullshovel
2—Northwest Model 6—shovel and crane
1—Lorain 1¾ yd. diesel shovel
1—Lorain 2 yd. diesel shovel
1—Quickway Model J Crane on GMC truck
1—Northwest Model 80-D 2½ yd. diesel shovel

HODGE & HAMMOND, INC.
1100 E. 156 St., New York 59, N. Y.

FOR SALE
1 Buckeye ¾ yard model #70 Shovel 1¾ yard Back Hoe Attachment and spare parts. Will trade for ½ yard machine.
S & S CONSTRUCTION CO.
Box 422 So. Fallsburg, N. Y.

FOR SALE
PAVER 34-E Koehring Dual Drum Located Near Memphis, Tennessee. $8,000.00.
SHOVEL ATTACHMENT ¾ Yard Buckeye. Unused. $750.00. Located Kenner, Louisiana
T. L. JAMES & COMPANY, INC.
Kenner, Louisiana

FOR SALE
Thermopane Glass
710 Lites 14 x 15-11/16
HARWOOD CONSTRUCTION CO., INC.
1520 K Street, N. W. Washington 5, D. C.
Phone RE-0707

TRACTORS
Int., TD-9 Dozer & Shovel Front Cat. D-2 with T2 Traxcavator
Cat. D4 with hydraulic bulldozer.
Cat. D4 Traxcavator with 1 yd. bucket.
4—Cat. D-8-2U Series, DDPCU, st. blade.

READY-MIX CONCRETE PLANTS
Butler 300 ton, 2 compt. aggregate; one compt. 400 bbl. cement complete with scales and elevator.
Bulk cement bin 350 bbls. complete. New.
400 bbl. Bulk Cement bin weight batcher. New.
Two 100 ton 3 compt. aggregate bins. Complete.
600 bbl. Bulk Cement Silo.
Heltzel 100 ton 3 compartment aggregate bin.

SHOVELS—CRANES—DRAGLINES
Marion Model 37 1-¾ yd. Elec. Shovel.
Marion Model 392 Dragline 2½ yds. Diesel. 100' bm.
Page 621S Dragline, Diesel, 6 yds., 135' boom.
Buc-Erie Model 54B 2½ yd. Diesel Shovel.
Buc-Erie 37B Diesel Crane, 100' boom, 35 tons.
Lorain Model 82 Diesel Shovel, 2 yds.
Lorain Model 820 Diesel Crane, 40 ton cap. 90' bm.
P&H Model 1055 Diesel Dragline, 80' boom.
Lima 1201 High Lift Diesel Shovel.
P&H Model 1055 High Lift Shovel. Buda Diesel
Northwest 80D 2½ yd. Diesel Shovel. 1946.
Northwest 25 Diesel Shovel ¾ yd. dyers 83 Shovel & Crane, 50' Boom.
P&H 855B 2 yd. Diesel Shovel. New Feb. 1947.
Buc-Erie 200B, 6 to 10 yds. Elec. Shovel.
Buc-Monighan 6 to 8 yds. Diesel Dragline.
Buc-Erie 120B 4 to 5 yds. Elec. Dragline.
Lorain MC4 Moto-Crane. New 1943. 75' Boom.

GRADERS—TRANSIT MIXERS
ROAD FORMS—FINISHERS
Barber Greene Asphalt Spreader Model UD6.
B-G Model 879 Asphalt Finisher with extensions.
New Koehring Model 34-E Paver.
Koehring Model 34-E Twin Batch Paver.
Koehring longitudinal Finishers 20-24 ft.
3 Caterpillar 12 Patrol Graders, 9K Series.
Adams 412 Motor Grader with scarifier.
Austin Western Model 99M Auto Patrol Diesel.
Adnum Asphalt Finisher; Hercules gas. engine.
Jaeger 2-yd. Transit Mixer on Mack 38.
REX 1½ yd. Transit Mixer on Diamond T truck.
Road Forms: Blaw Knox 8000 ft. 9x9.

TRENCHERS
Cleveland Baby Digger Model 95, New 1943.
Buckeye Mod. 120, Cap. 24" to 30". 12 ft. deep.
Barber-Greene Model 44C. Excellent condition.
Buckeye M-12 capacity 18" to 7 ft.

ASPHALT PLANTS
Masden 3000# capacity. Complete.
Cedar Rapids "Speedline". Complete.
Cedar Rapids Model B. Complete.
Barber-Greene Model 848 "Travel Plant".
Barber-Greene 842 Portable Utility Plant. Complete

STIFF LEG AND GUY DERRICKS
American stiff leg 40 to 50 tons 80' boom.
American Terry Steel stiff leg 100 ton 75' boom.
American 20 ton stiff leg 90' bm.
American 15 ton stiff leg 65' boom.
Wiley Mod F. stiff leg 60' bm. NEW.
Ketler 25 ton steel Guy 100' mast 90' boom.
Terry 22 ton Guy Derrick 115' mast 100' boom.

ROCK CRUSHING & SCREENING PLANTS
Cedar Rapids Junior Tandem plant. New 1947.
Cedar Rapids Portable "Pitmaster". Complete.
Pioneer Model 56 Portable Crushing Plant.
Cedar Rapids 2-A Portable Crushing & Screening

PUMPCRETES
REX 160-180-190-200 with fittings.

RICHARD P. WALSH CO.
30 Church St. New York 7, N. Y.
Cable RICHWALSH COrtlandt 7-0723-4

FOR SALE

1—"Caterpillar" D7 tractor with bulldozer. R & G.
1—"Caterpillar" D4 tractor with bulldozer.
1—"Caterpillar" RD4 tractor with bulldozer.
1—"Caterpillar" Diesel D4 tractor with Athey Overhead Loader, new 1949, demonstrator. Bargain.
1—"Caterpillar" diesel #10 tandem motor grader, nice condition, good tires.
1—"Caterpillar" Diesel #12 motor grader. Good tires. R & G.
1—D13300 Engine Replacement for D8 tractor. Rebuilt.

T. SOUTHWORTH
TRACTOR & MACHINERY CO., INC.
Glenwood Road-Menands, Albany 4, N. Y.
Phone Albany 5-5255

FOR SALE
STEEL TUNNEL LINER PLATES

Size ⅛" x 16" x 37 11/16"
Enough for 400 ft. at 6 ft. dia.
Will sacrifice for immediate disposal.
Notify
Intercounty
Construction Corporation
P. O. Box 101
Waterbury, Connecticut
or
P. O. Box 329
Hyattsville, Maryland

1—Acme factory rebuilt 12 ton, 3 wheel roller
1—Gasoline powered 5-6 ton tandem, rebuilt.

ACME ROAD MACHINERY CO.
FRANKFORT, N. Y.

Pile Driving Equipment

Vulcan and McKiernan-Terry
Steam Pile Hammers and Extractors
Pile Driving Accessories
Drop Pile Hammers and Caps
Steel Sheet Piling

CONTRACTORS MACHINERY Co.
2637 Southwest Blvd. Kansas City 8, Mo.
Phone Valentine 4740

WHOLESALE PRICES—
PNEUMATIC TOOLS
NEW OR REBUILT
ELKIN 3263-81 ST. JACKSON HTS., N. Y. HA-9 7810

FOR SALE
1—Buckeye Trencher Model 160, Ser. No. 4126. Good condition.
1—Insley 8-wheel 12-ton Platform Trailer. New May 1948.
McGowen Contracting Co., Inc.
OPELIKA, ALABAMA
Phone 1218 P. O. Box 908

CRANES & LOCOMOTIVES

100 ton Baldwin diesel elec. locomotive 660 HP. New 1942.
100 ton Alco diesel elec. locomotive built 1939. 660 HP.
35 ton Ohio Type G locomotive cranes built 1943. Buda engine.
50 ton Whitcomb diesel elec. locomotive new 1942. First class shape.

MISSISSIPPI VALLEY EQUIPMENT CO.
501 Locust St. St. Louis 1, Mo.

FOR SALE *CHEAP*

2—New D-13,000 Caterpillar Diesel Engines. 125 H.P. Complete with Clutches and Pulley-drives.
1—Schramm Diesel 315 cu. ft. 2 stage comp. 1947.
1—LeRoi Diesel 315 cu. ft. 2 stage compressor, pneumatic tires, new 1946.
150 ton Porter Loco 0-6-0 Std. gauge.

HARRY C. LEWIS
899 East Grand Street Elizabeth, N. J.

FOR SALE

1—1½ Cu. Yd. Amsco Shovel bucket, new, complete with teeth and sheave for P & H Shovel. Price $1450.00

Phone Williams 1-8600
Hillsgrove, Rhode Island

D-8 DOZER

Serial #2U5599 Cat. Tilt Blade 2-Drum Cat. Hoist or Cat. Hydraulic Blade.

STEWART S. SILL
Sodus Point, New York

FOR SALE
New Bucyrus-Erie 200-W diesel dragline

125' Boom, 6 yd. Bucket, 390 H.P. Engine
Never used, immediately available, central location. Address
FS-1049, Engineering News-Record
68 Post Street, San Francisco 4, Calif.

FOR SALE
100 TON TRAILER

Rogers I Beam—1400 x 24 Tires—with Autocar Tractor—equipped with 200 H. P. Cummings Diesel Motor—Tandem Drive—1400 x 24 Tires—100 Ton Garwood Winch—New 1949—Never Used. Cost $33,500.00. Will Sacrifice for Quick Sale.

LAVINE'S EQUIPMENT COMPANY,
Columbia Turnpike, Rensselaer, Albany, N. Y.

FOR SALE

Bucyrus-Erie Steam Shovel, model B2 in excellent condition.

Lo Conte Excavating Co., Inc.
532 North Seventh Street Newark 7, N. J.

FOR SALE

Paragon Revolute 42 inch printing machine. Purchased new in 1934 for $1,100. Has had good care and now in good repair. Price $500 F.O.B.

UNITED NATURAL GAS COMPANY
308 Seneca Street, Oil City, Pennsylvania

FOR SALE
ALL LATE MODELS

1—P&H Shovel, 1055 1.C. 3" c.y. New Aug. 1948.
1—P&H Shovel, 1055, 3 c.y. New Aug. 1948.
1—80-D N.W., 2½ c.y. New Feb. 1948.
2—Manitowac 3000A, 1¾ c.y. New Mar. 1947. Combination drag and shovel front.
1—Lorain s20, 2 c.y. New Mar. 1947. Rocket Bucket.
4—Caterpillar D-8 Late models, with double power winches.
4—Euclid Dumps, 9 c.y., 150 H.P. Cummins. New Sept. 1948.
16—Ward LaFrance trucks, DIC Models, 12-14 ton payload. New Jan. 1948.
1—Highwall Drill. New Nov. 1948.
1—Coal Loading Bucket, 2½ c.y., 6 teeth, for Manitowac 3000A Shovel, New.
2—Drag Line Buckets, 2 c.y., slightly used.

BOWER MINE, INC.
Box 1589 CLARKSBURG, W. VA
Telephone:
Clarksburg, W Va., Flemington 79

Scoopmobiles & Buggymobiles

NEW & USED
For Sale or Rent

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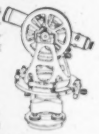

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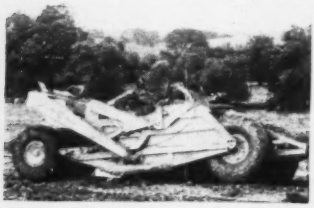

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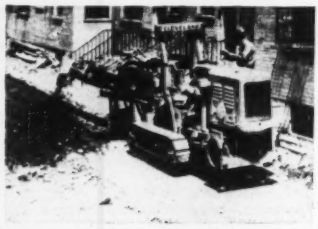

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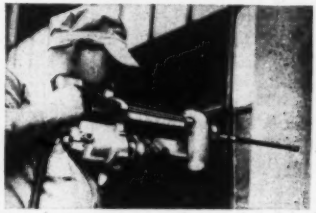

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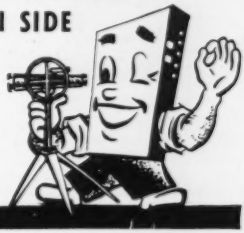
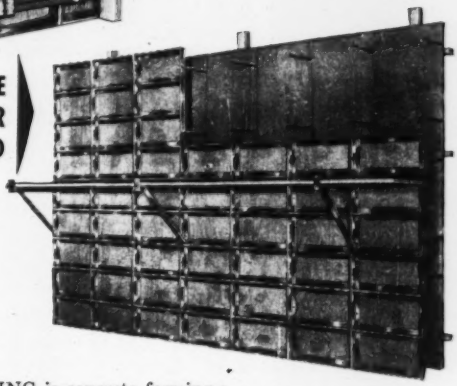
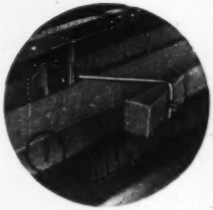


FRONT SIDE NO LINER REQUIRED





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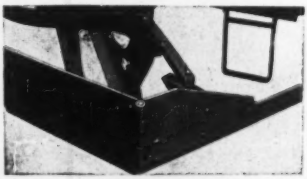

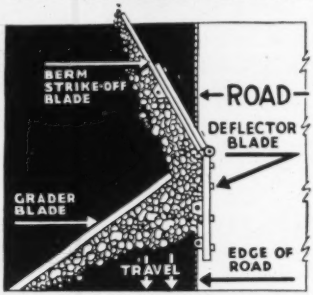

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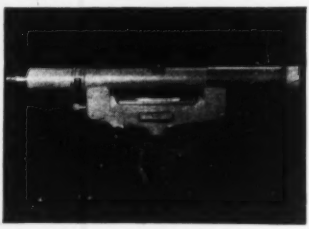
Attachment for the Galion 402 motor grader is designed to quickly reshape worn and dangerous road berms. It is attached to, and works in conjunction with, the motor grader moldboard and circle. As the grader is run along the pavement edge, its blade reshapes the berm driving excess material against a deflector plate. From here, the material passes to the strike-off blade. Concentration of material in the corner of the deflector is said to assure complete filling and reforming of the berm. The angle of the strike-off blade and the hinged section of the deflector plate is adjustable to suit varying materials and operating conditions. — THE GALION IRON WORKS & MFG. CO., GALION, OHIO.



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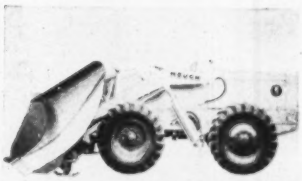

Snow Plow for Payloader

Reversible and V-type snow plows attach to the 4-wheel-drive Model HM Payloader. Features of the HM include 75-hp. gasoline or diesel power unit, large pneumatic tires, hydraulic power control of raising and lowering of the plow, speeds up to 24 mph., power-boosted rear-wheel steering, hydraulic brakes, and all-weather cab available as optional equipment.—THE FRANK G. HOUGH CO., 882 SUNNYSIDE AVE., LIBERTYVILLE, ILL.

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Attachment for the Adnun blacktop paver is used for laying stone or chips, taking full advantage of the 4-wheel-drive design of the Adnun, eliminating slipping and improving traction. Attachment consists of rubber-tired wheels which replace the rollers under the rear of the paver. The device can be attached to units already in service, and is said to eliminate pitting of the rollers when laying coarse stone.—THE FOOTE CO., NUNDA, N. Y.

Check Valve for Air Lines

Automatic safety check valve eliminates hazard of whipping air lines. The Danielson valve instantly checks the flow of air whenever a break occurs, whether accidental or when tools are being changed. It also detects faulty tools and leaky air lines as it will not permit operation of a pneumatic tool if the connecting line has a major leak. The valve has been pressure-tested at 3,000 psi.—DANIELSON SAFETY VALVES, INC., P. O. BOX 1629, RICHMOND, CALIF.

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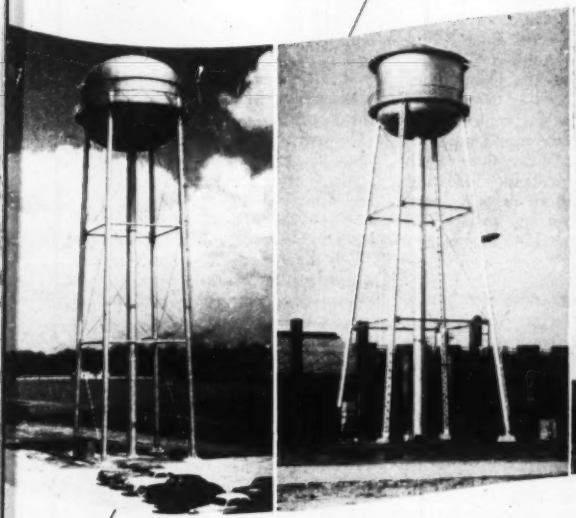

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One-Quart Blow Torch

Manufactured in two models, the 330-S is filled by removing the pump; the 330-BS, through a filler plug on the funnel-shaped bottom. The shut-off valve is equipped with a replaceable needle pin which is designed to not break off or clog the torch. A small spring keeps the pump-plunger washer spread for positive pumping action. The tank is made of brass. The fuel line from tank to burner is equipped with a mesh strainer to prevent flash back.—P. WALL MFG. CO., 291 ERIE ST., GROVE CITY, PA.

Manufacturers' Publications

Wagon Drills—This 12-pager is devoted to three sizes (light, medium, and heavy weight) of wagon drills. An interesting feature of the bulletin is a series of line drawings showing how drilling costs can be reduced with these highly mobile wagon mountings. These illustrations indicate initial equipment savings as well as savings in operating costs. The booklet is illustrated with photographs of various field applications.—JOY MFG. CO., HENRY W. OLIVER BLDG., PITTSBURGH 22, PA.

Asphalt-Heating Burners—Low-pressure air-atomizing oil burners for use with asphalt heaters or other heat-processing applications are described in an 8-p. catalog. These burners are designed for burning oil or a combination of an oil and gas. Feature of Bulletin 409 is a description, accompanied by a cutaway drawing, of the principle of operation of these burners. Tabulated data list capacities and dimensions of the Series B units and valve capacities. Another Bulletin, No. 1063, describes the Hauck portable hopper-car-thawing tube equipment. Feature of this bulletin is a description of a new model available with a powerful, heavy-duty torch flame heating burner which does not require compressed air or other auxiliary equipment for its operation.—HAUCK MFG. CO., 124 TENTH ST., BROOKLYN 15, N. Y.

Plastic Reflectors—Use of Stimsonite all-plastic reflectors for highway and other signs to make night driving safer and easier is described in an 8-p. catalog. Bulletin AP features a description of the light-reflecting facets of the Stimsonite transparent backing and how the backing is permanently fused into a waterproof and dustproof reflector. Stimsonite features listed in the catalog include superior performance, uniform and gem-like molding, wide-entrance angle, all-weather top efficiency, ease of installation, see- and read-ability, and low-cost maintenance.—AMERICAN GAS ACCUMULATOR CO., 1027 NEWARK AVE., ELIZABETH 3, N. J.

Construction Equipment—Publication is announced of a construction issue of "Production Road." It features an informative account of the building of Hungry Horse Dam in Montana, and indicates the various types of construction equipment used on this project in which Twin Disc clutches and hydraulic drives are incorporated. This issue of the publication is 36 pages in length.—TWIN DISC CLUTCH CO., RACINE, WIS.

Breaker With Air-Lift Leg—Bulletin describes Model 52AJ paving breaker, the feature of which is the utilization of line air pressure to actuate an integral leg to lift the breaker and to free stuck steel. The bulletin illustrates how the air-lift leg operates, and lists advantages said to accrue through its use. Also listed are specifications and dimensions of the Air-Jac.—LEROI CO., 1701 S. 68TH ST., MILWAUKEE 14, WIS.

Arc Welding Accessories—Twenty-page catalog contains descriptions, specifications, and prices of more than 150 arc-welding accessories. Bulletin GEC-253A includes information on electrode holders, helmets and goggles, tungsten electrodes, all types of protective aids and clothing, electrode carriers, cable connectors, ground clamps, brushes, cleaning tools, fillet weld gage, and others. — GENERAL ELECTRIC CO., APPARATUS NEWS BUREAU, SCHENECTADY 5, N. Y.

Compressor Regulator — Improved regulator for Drill-More Capacity Control of portable compressors is fully described in a new folder. Features of the UL-83 Floating-Speed regulator, explained in detail in the folder, include slowing down of the compressor to lowest practical working speed, compressor capacity is varied throughout the entire speed range without speed steps or cycling, compressor cylinders unload only when the minimum speed delivers more air than needed, and wasteful idling is eliminated. The folder points out that the UL-83 automatically varies the speed by adjusting the engine governor spring.—INGERSOLL-RAND CO., 11 BROADWAY, NEW YORK 4, N. Y.

Bit Selection Guide — Reference chart enables construction workers or installation men to determine the correct size concrete drill bit to use for any given size of pipe, conduit, machine bolt, or concrete anchor. In use, the diameter of the pipe or conduit is located on the chart and the correct size drill bit then appears directly opposite. Or the procedure can be reversed. Designed for hard use, it can be used as a wall chart or carried on the job.—TILDEN TOOL MFG. CO., 1995 N. FAIR OAKS, PASADENA 3, CALIF.

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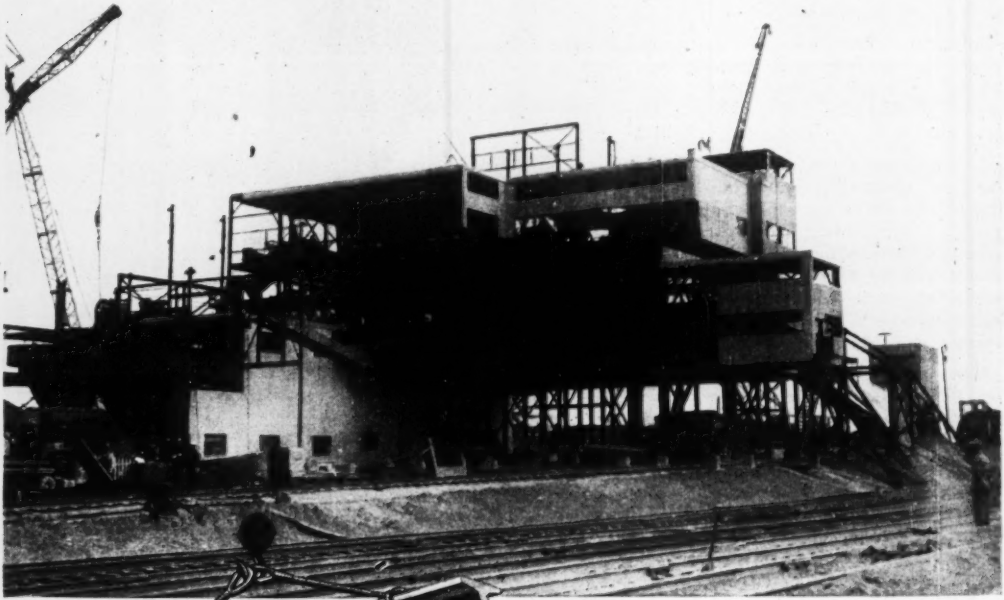

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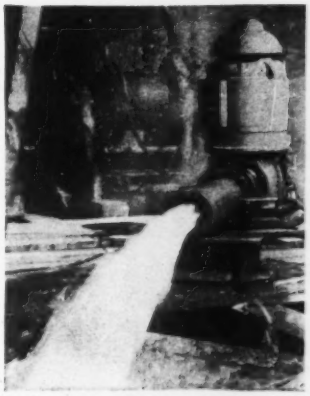

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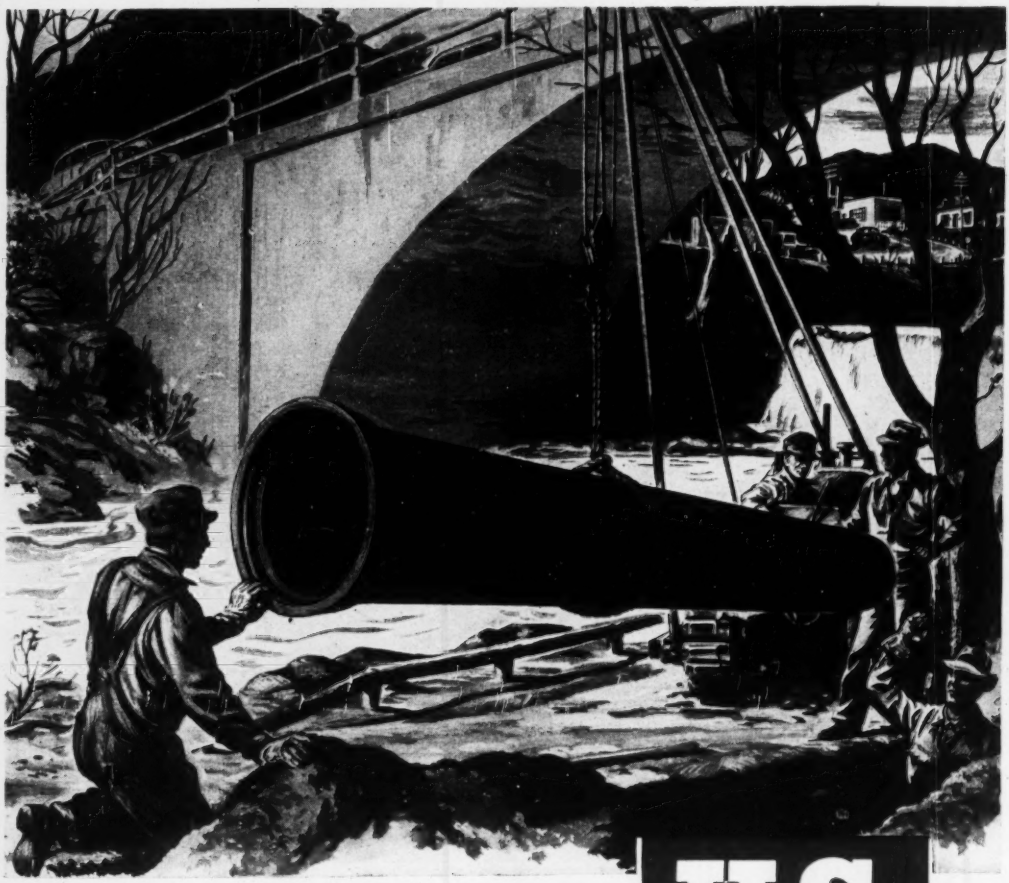

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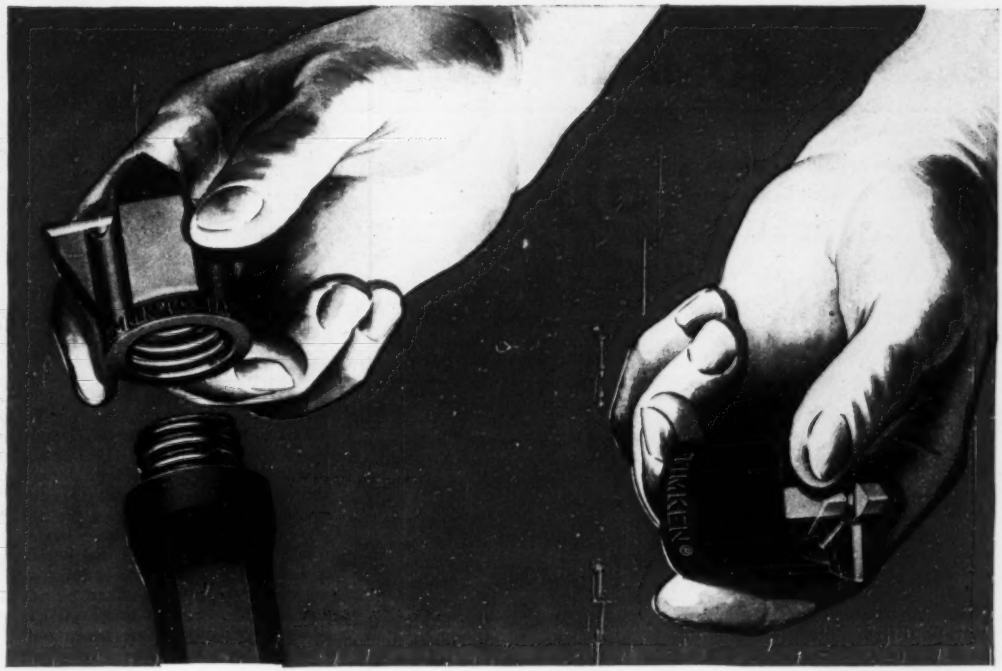

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Uneconomic Public Projects

Sirs: ENR continues to give attention to the current reorganization plans covering reclamation, flood control, navigation and power but other related features have not received the deserved attention.

Simply stated the facts are: 1) Many of these projects should not now be built because the economic benefits are far from sufficient for justification. 2) Government engineering agencies have taken over work which should be done by private engineering and/or capital.

The Colorado Big Thompson project would today, if privately financed, be in bankruptcy beyond the pale of further financing. The costs have long since passed the estimated total, and the amount of water obtained has failed to equal that called for in the plans. Notwithstanding failure in this attempt at high altitude diversion of socalled surplus runoff, Reclamation is now promoting a new monumental plan of high altitude water diversion in the mountains of Central Colorado. In view of the present farm surplus and farm subsidies, the economic benefits of this project as compared to the costs can be described in no other terms but "fantastic."

With regard to the second point, a typical example of "socialized engineering" is the proposed Reclamation project on the Canadian River in Texas which project must primarily provide city water supplies in order even to begin to justify costs. City water supplies have always been adequately engineered by private consultants and there is no reason for federal engineering of same at this time.

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Break-Point Chlorination

Sir: There is listed on p. A5 of the Sept. 1, 1949 issue, ENR, among significant events under date, 1928, "Phenomenon of 'break-point' chlorination reported by R. D. Scott." This is not a misstatement because it is true that Mr. Scott did observe, when making chlorine demand tests, that there might be a point where residuals dropped off as chlorine application was increased. He also noticed that phenolic tastes and odors practically disappeared at this point.

Mr. Scott, however, neither applied the term "break-point" to this phenomenon nor attached any particular significance to it. He simply pointed out that such a phenomenon occurred but he had no answer for it.

It was not until 1939 that Mr. Harry Faber and I checked on this phenomenon and found that it did occur in certain waters, but not in others. By 1940, it was established that ammonia was the cause of this increase and decrease in residuals with increasing applications of chlorine.

During the winter of 1940, this phenomenon was called "break-point" chlorination and was made a feature of the Water Purification Section meeting of the American Water Works Assn. annual convention in Kansas City. Between January first and the date of this convention the terms—"break-point" chlorination—were used for the first time.

The high-light of that meeting was the presentation by Mr. Horace Brown of Ottumwa, Iowa who related how he had licked his problems of taste and odor by the application of 110 ppm. or more of chlorine.

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Panel Heating to Remove Snow

Sir: Through the years 1937 and 1938, the writer studied the winter characteristics of New York City and endeavored to find through laboratory research possible methods of using heat in pavements there for snow removal. Results of this work, embodied in a thesis now available at the library of the City College with the catalog marked T10, contain sufficient data to enable the problem of snow removal to be solved with the maximum of economy.

It should be remembered that radiant heat, applied to dwellings, is economical because of heat absorbed by the embedding concrete and the ground flows to the surface when the heat supply is shut off. However, when applied to pavements for the purposes of snow removal, radiant heat has several disadvantages:

1. After shutoff, the outflow of heat from the ground is slower than the inflow and the large percentage of heat diffused downward may reach the surface when the snow has melted, or at a rate insufficient to melt it.

2. To protect the pipe coils against concentration of traffic loads, they must be embedded at a considerable depth from the surface—which retards the flow of heat and requires a higher temperature at the source.

3. Accumulated snow (if accompanied by moisture) will readily melt on application of heat, but dry snow, once accumulated, will not melt unless the rate of heat applied is equal to or exceeds the latent heat in the whole mass of snow.

4. Ripping the pavement, for installation of utilities or for any other purpose whatsoever, becomes costly.

However, a study of the problem reveals that the cost of snow removal by this means will be at a minimum when: (1) The heating elements is placed as near the surface as possible (no deeper than 1 in.). (2) The application of heat is intermittent or controlled so as to prevent the dissipation in the ground or in the air. (3) In a water system, the water is readily drainable as soon as the system is shut off. (4) The system is designed in units sufficiently small to permit street repairs and alterations. (5) Existing heating plants are used, with one or two street blocks assigned to each plant.

However, these requirements cannot be met unless some new conceptions of pavement designed are utilized. Water or steam can be used as heating media without pipe coils if cellular pavements are used.

The writer has two types of design in mind that could be varied to suit.

Type A would be a two-slab pavement, the base being a trough of concrete poured in place, the top a precast thin ribbed slab with rows of slender piers closely spaced. Only the edges would be watertight.

Type B would be a two-slab pavement also, but the two would be poured in place—the base as a trough and the top as a thin slab resting on construction paper and supported by 1-in. dia. ceramic spheres, which provide voids for water circulation and are capable of transferring traffic loads to the base. These items might be costly in small quantities, but not so in larger quantities.

Comparative costs of removing snow from the streets of Manhattan for the winter 1933-34 per sq. yd. per yr. were estimated to be $1.56 for electricity as against $0.07 for water and $0.08 for steam. Although electricity appears to be excessively costly, it may find application in small scale at intersections where many surface obstructions exist.

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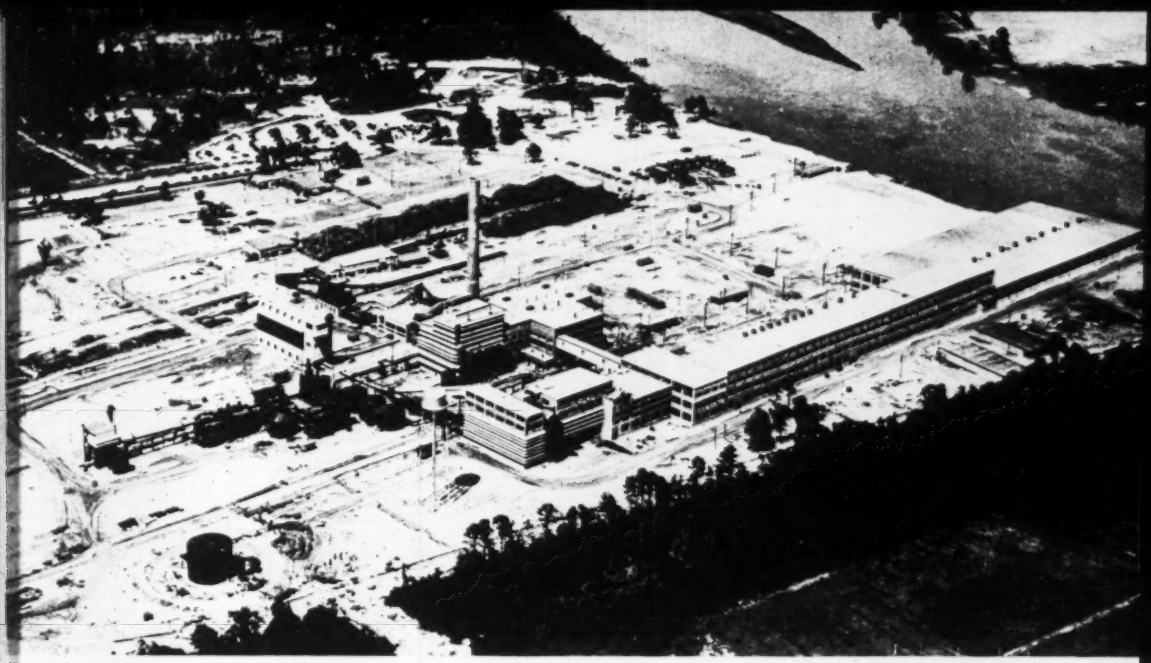

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